



ARMY INSTITUTE OF PATHOLOGY

GUIDE
TO THE EXHIBIT ON
THE HISTORY OF NEUROPATHOLOGY

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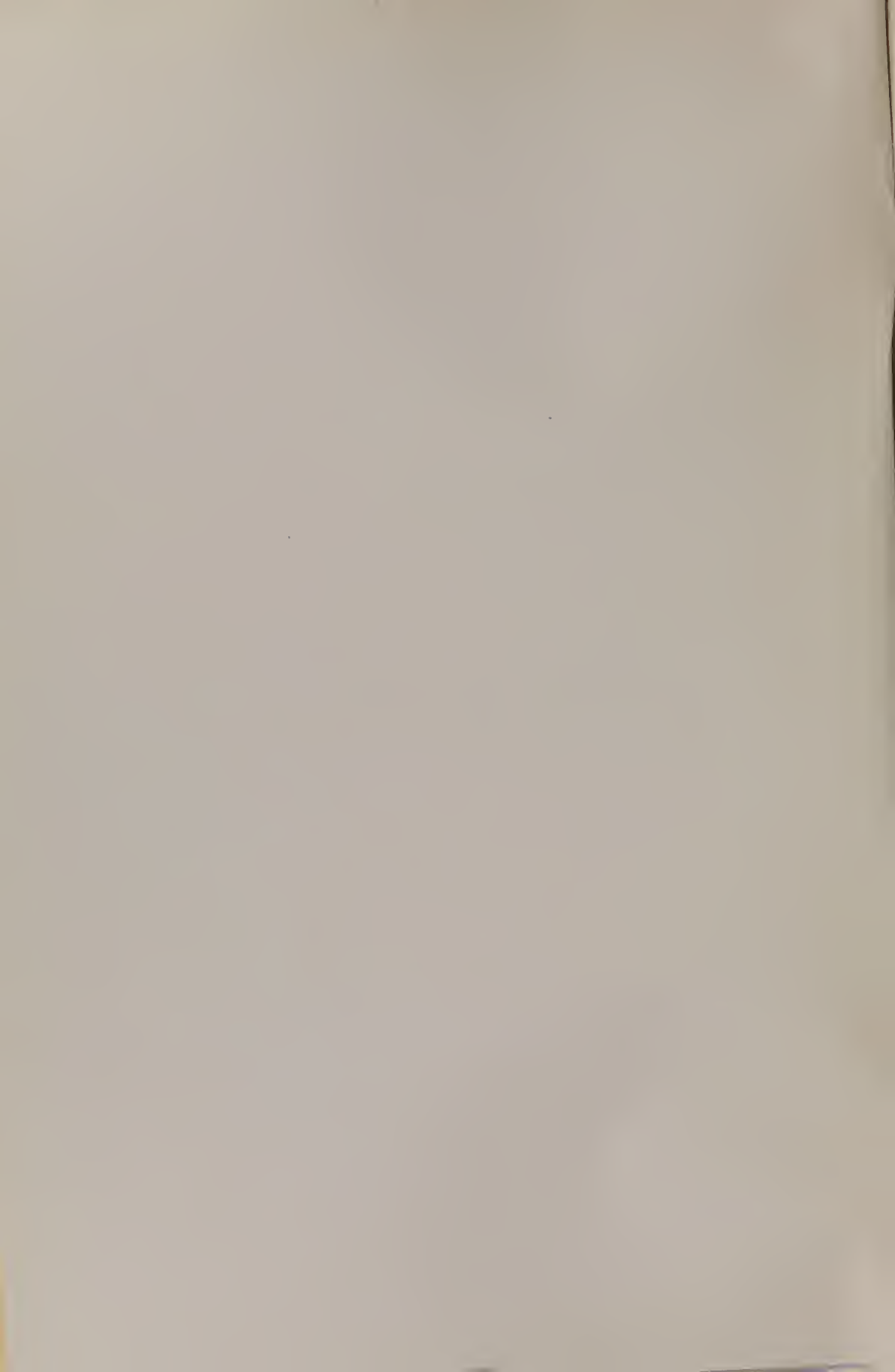
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G U I D E
TO THE EXHIBIT ON
THE HISTORY OF NEUROPATHOLOGY

PRESENTED AT THE ANNUAL MEETINGS OF THE
AMERICAN PSYCHIATRIC ASSOCIATION

Washington, D. C., May 17-20

AND THE
AMERICAN NEUROLOGICAL ASSOCIATION

Atlantic City, N. J., June 14-17

WEBB HAYMAKER, M.D.
Army Institute of Pathology

WASHINGTON, D. C.

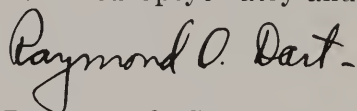
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The Director and the Staff of the Army Institute of Pathology extend greetings and a cordial welcome to the American Psychiatric Association by presenting this exhibit on the history of neuropathology at the 104th annual convention of the Association starting in Washington on May 17, 1948.

Assembled by Dr. Webb Haymaker, outstanding neuropathologist on the staff of the Army Institute of Pathology, from the vast resources of the Army Medical Library and the Army Institute of Pathology, this exhibit may well serve as an example of the unlimited opportunities offered by The Surgeon General of the Army through these two great institutions for study and research; one a great storehouse of medical literature, the other a vast collection of well documented pathologic material, which assembled under one roof constitute a combination unique in the history of medicine.

It is appropriate that there should be a close liaison between the American Psychiatric Association, the American Neurological Association, the American Association of Neuropathologists, and the Army Institute of Pathology, an outgrowth of the Army Medical Museum, whose founder, Surgeon General William A. Hammond, was the first to describe athetosis, and who wrote the first textbook on clinical neurology to be printed in the United States. This link has been reinforced through the participation of these Associations in the American Registry of Pathology.

Though limited to the works of selected scientific discoverers who during the past one hundred years have made significant contributions to neuropathology, this brochure may be regarded as an introduction to a more comprehensive work on the subject such as does not exist, and for which there is a great need by students in neuropsychiatry and neuropathology today.



RAYMOND O. DART
Brigadier General, U. S. A.
Director

It is a pleasure to welcome the American Psychiatric Association, at its 104th Annual Convention at the Statler Hotel, in Washington, D. C., May 17 to 20, 1948.

You are cordially invited to visit the Army Medical Library during your stay in Washington so that you may become acquainted, if you have not already done so, with its almost unlimited resources in the field of medical literature. The Index-Catalogue and the Current List of Medical Literature are the indexes to the Library's collections, which are available to the Armed Services, local physicians, institutions, and libraries throughout the country. Doctors, research workers, and others away from Washington may use our collections on interlibrary loan, through their local libraries, or by photoduplication.

The Exhibit is being sent to the meeting of the American Neurological Association in Atlantic City in June, and with it go our best greetings.

The opportunity for the Army Medical Library to collaborate in the preparation of this Exhibit on the History of Neuropathology is very much appreciated.

A handwritten signature in dark ink, reading "J. H. McNinch". The signature is written in a cursive style with a large, stylized initial "J".

J. H. McNINCH
Colonel, Medical Corps
Director, Army Medical Library

REGISTRY OF NEUROPATHOLOGY

This would appear to be an excellent opportunity to bring to the attention of psychiatrists, neurologists and neuropathologists their Registry of Neuropathology. This Registry is one of fifteen that constitute the American Registry of Pathology, a division of the Army Institute of Pathology.

The beginnings of the Registry are a bit nebulous and involved. The first glimmer was a letter from Dr. H. G. Wolff dated July 19, 1939, making an inquiry of the then Curator of what was at that time the Army Medical Museum as to the possibility of including neuropathology in the Registry activity. Later that year the establishment of a Registry of Neuropathology was approved by the Surgeon General of the Army and by the National Research Council.

Nothing concrete however came of this auspicious start until May, 1941, when Dr. Walter Freeman, who had been interested in the project for some time, presented the matter to the American Neurological Association. In the meantime Dr. Ebaugh, then president of the American Psychiatric Association, had obtained an appropriation from the Rockefeller Foundation for the preparation of study sets in neuropathology and these were prepared at the University of Colorado by Dr. Neuburger. Dr. Ebaugh approached the Curator of the Army Medical Museum about the possibility of taking over the administration of these sets and the preparation of an accompanying atlas. He also recommended that the American Psychiatric Association cooperate in the establishment of a central registry in neuropathology.

The sets were received at the Army Medical Museum in early 1942. A syllabus to accompany them was prepared shortly thereafter. Sets and syllabuses were immediately put to use on a loan basis, but the Registry of Neuropathology was still in the nebulous stage. An illus-

trated Atlas of Neuropathology was completed in the early part of 1944. During the following two years the original sets underwent extensive revision at the Army Medical Museum.

Early in 1944 the American Association of Neuropathologists was asked to collaborate with the American Psychiatric Association and the American Neurological Association in the Registry activity. The Association very promptly accepted this invitation and appointed the following members to represent them on the central committee: Dr. Joseph Globus, Dr. B. J. Alpers, Dr. Walter Freeman, and Dr. Armando Ferraro. There is no documentary evidence that the representatives of the three societies have had a joint meeting but the Registry has been functioning actively, being blessed by the continuation on duty at the Institute of Dr. Webb Haymaker, who has guided its professional destinies from the beginning. He has supervised the recent preparation of an entirely new collection of loan sets on neuropathology and another collection of fifty slides each on brain tumors. It is contemplated that in time new illustrated atlases will be available to supplement the study of these slides. The advice of the various members of the Committee has been freely used in the preparation of this important teaching material. During the past three years the various loan sets covering neuropathology have been used by approximately six hundred institutions and individuals.

With the reorganization of the Institute in 1946 its name was officially established as the Army Institute of Pathology, and the National Academy of Sciences became the fiscal agent for the American Registry of Pathology. The Committee on Pathology of the National Research Council is the advisor in professional, administrative, and financial matters to the Registry.

The chief purpose of this foreword is to make you all aware of your Registry and to persuade you to send to the Institute cases that will be appropriate for Registry purposes, not necessarily limited to tumors nor to rare and bizarre conditions. In order to prepare teach-

ing material it is necessary to have a large reservoir from which to select, and for definitive studies it is essential that as many cases as possible be accumulated in important categories of disease. There are great possibilities in the undertaking, and the enthusiastic cooperation of the members of the participating societies is essential to their development.

The process of registering cases is a painless one. Registry forms are available that furnish an easy way of supplying clinical data. All the pathologic material that can be spared should be furnished. An important function of the Registry is the continued follow-up of appropriate cases to determine the life histories of the various diseases, to determine diagnostic and prognostic criteria and to evaluate methods of treatment.

For information about the Registry, its publications and loan study sets address The Director, Army Institute of Pathology, Washington 25, D. C.



J. E. ASH
Colonel, U.S.A., Ret.
Scientific Director
American Registry of Pathology

REMARKS ON THE EXHIBIT

The United States Army Medical Department takes pleasure in presenting this exhibit on the History of Neuropathology to the members of the American Psychiatric Association and the American Neurological Association. The choice of neuropathologists to be represented was not an easy one, for it was felt necessary to include not only morbid anatomists but also experimentalists and those who set the stage for modern neuropathology by their enunciation of the fundamental principles of degeneration or by their discovery of staining techniques. When broadly viewed, the works of Waller and Türck and Cajal and Flexner were no less significant in the field than those of Virchow and Alzheimer and von Economo and Wickman. The original plan was to restrict the number of neuropathologists to 40, including only those who were no longer living. In an effort to obtain a consensus as to which were of most importance, ballots containing 75 names were sent to Dr. Arthur Weil, Dr. F. H. Lewy and Dr. Nathan Malamud, but their choices were so varied that the number had to be set arbitrarily at 50. The exhibit will be regarded as successful if those at variance with our selections will so communicate with one of us.

In this Guide will be found portraits, brief biographies, and references to the most important works of the 50. The arrangement is on the basis of the countries in which they worked, and an attempt has been made to strike a balance in the representation of the countries. On display in the exhibit is a selection of the original works of this brilliant succession of scientists.

These few brief biographical data leave untold the personal background of these men. The recounting of the events leading to their crowning achievements still awaits the facile pen of someone of kindred pursuit. Though these were men of no ordinary endowment, they had their failings: Golgi, for instance, depreciating Cajal's work on receiving jointly with him the Nobel Prize in 1906, and Cajal repudiating Hortega's discovery of the microglia. They had their triumphs but they also had their disappointments and tragic denouements—Wickman's suicide on the occasion of his failure to be selected to suc-

ceed Medin to the chair of Pediatrics in Stockholm, Weigert's bitterness at not being chosen to the chair left open by Cohnheim in Leipzig, Hortega's grief in watching his Institute in Madrid being pulverized by shellfire during the Spanish Civil War, Bielschowsky's estrangement with O. Vogt and his distress at being forced into exile. Some strode a road resounding with acclaim—these included Charcot, Dejerine, and Hughlings Jackson; others, for instance, Flatau and Henschen, struggled for years before gaining recognition. A few were of Napoleonic mien—none more so than von Bechterew; some were Olympian in their discourses—Kinnier Wilson was the prototype; some, such as Nissl and Waller, were possessed of quiet grace. All, however, had in common the qualities of originality, imagination, and immense energy.

These are the 50 men who were largely responsible for the emergence of psychiatry and neurology to their present levels, and further advance of these new sciences will depend, in large part, on the intellectual curiosity and ability of their successors.

Acknowledgments. Some of the portraits were taken from the collections of the Army Medical Library and the Army Institute of Pathology. Others were obtained from medical periodicals and books, either out of print or current. To the contributors, known and unknown, goes our grateful appreciation. We are indebted to Dr. Joseph H. Globus for the portrait of Spielmeyer, to Dr. F. H. Lewey for that of Spiller, to Dr. K. Lowenberg-Scharenberg for that of Jakob, and to Dr. Archibald Malloch for that of Ramsay Hunt. In addition to those mentioned, we wish to express appreciation to Dr. Robert Wartenberg, Dr. Walter Freeman, Dr. Percival Bailey, Dr. Armando Ferraro and Dr. Cyril Courville for their valued advice, and to Dr. Archibald Malloch of the New York Academy of Medicine and Mr. W. B. McDaniel II of the Library of the College of Physicians, Philadelphia, for their assistance in running down items which had eluded us. Credit for designing and contributing vignettes to the Guide goes to our artist, Mr. Herman Van Cott.

Webb Haymaker

WEBB HAYMAKER, M.D.
Chief, Neuropathology Section
Army Institute of Pathology

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NEUROPATHOLOGISTS
OF
GERMANY

RUDOLF LUDWIG KARL VIRCHOW (1821-1902)

Born in Pomerania, Germany. Graduated in medicine at the University of Berlin (1843), and became prosector at the Charité under Froriep (1845). Became Professor of Pathologic Anatomy at Würzburg (1849), and then at Berlin (1856), where he remained. He derived great inspiration from his teacher Johannes Müller.

His achievements were vast, even in the field of neuropathology. They included studies on neuroglia (1846), pachymeningitis hemorrhagica interna (1857), "central neuromas" (1864-65), malformations of the nervous system (1867), encephalitis (1868), meningiomas (1869, 1900), brain tumors (1869), and a host of other disorders.

Selected References

Ueber das graulirte Ansehen der Wandungen **der** Gehirnvventrikel, Allg. Ztschr. f. Psychiat. 3: 242-250, 1946.

Die krankhaften Geschwülste, vol. 3, Berlin, 1864-65.

Pathologie des tumeurs, 3 vol., Paris, G. Baillière, 1867, 1869, 1871.

Das Psammom, Virchow's Arch. f. path. Anat. 160: 32-34, 1900.



NICOLAUS FRIEDREICH (1825-1882)

Born in Würzburg, Germany. Studied medicine chiefly at Würzburg, where he was influenced by Kölliker. After graduation (1853), became assistant to Virchow, and when Virchow was called to Berlin (1856), succeeded him in the chair of pathologic anatomy. A year later he became Professor of Pathology and Director of the Medical Clinic at Heidelberg, where he did prodigious work for almost 25 years.

Counted among his greatest contributions are those on ataxia (Friedreich's disease) (1863, 1876) and progressive muscular atrophy and hypertrophy, dedicated, as were many of his works, to Virchow (1872).

Selected References

Ueber degenerative Atrophie der spinalen Hinterstränge, Virchow's Arch. f. path. Anat. 26: 391-419 et seq., 1863.

Ueber progressive Muskelatrophie. Ueber wahre und falsche Muskelhypertrophie, Berlin, A. Hirschwald, 1873.

Ueber Ataxie mit besonderer Berücksichtigung der hereditären Formen, Virchow's Arch. f. path. Anat. 68: 145-245, 1876.



FRIEDRICH DANIEL VON RECKLINGHAUSEN (1833-1910)

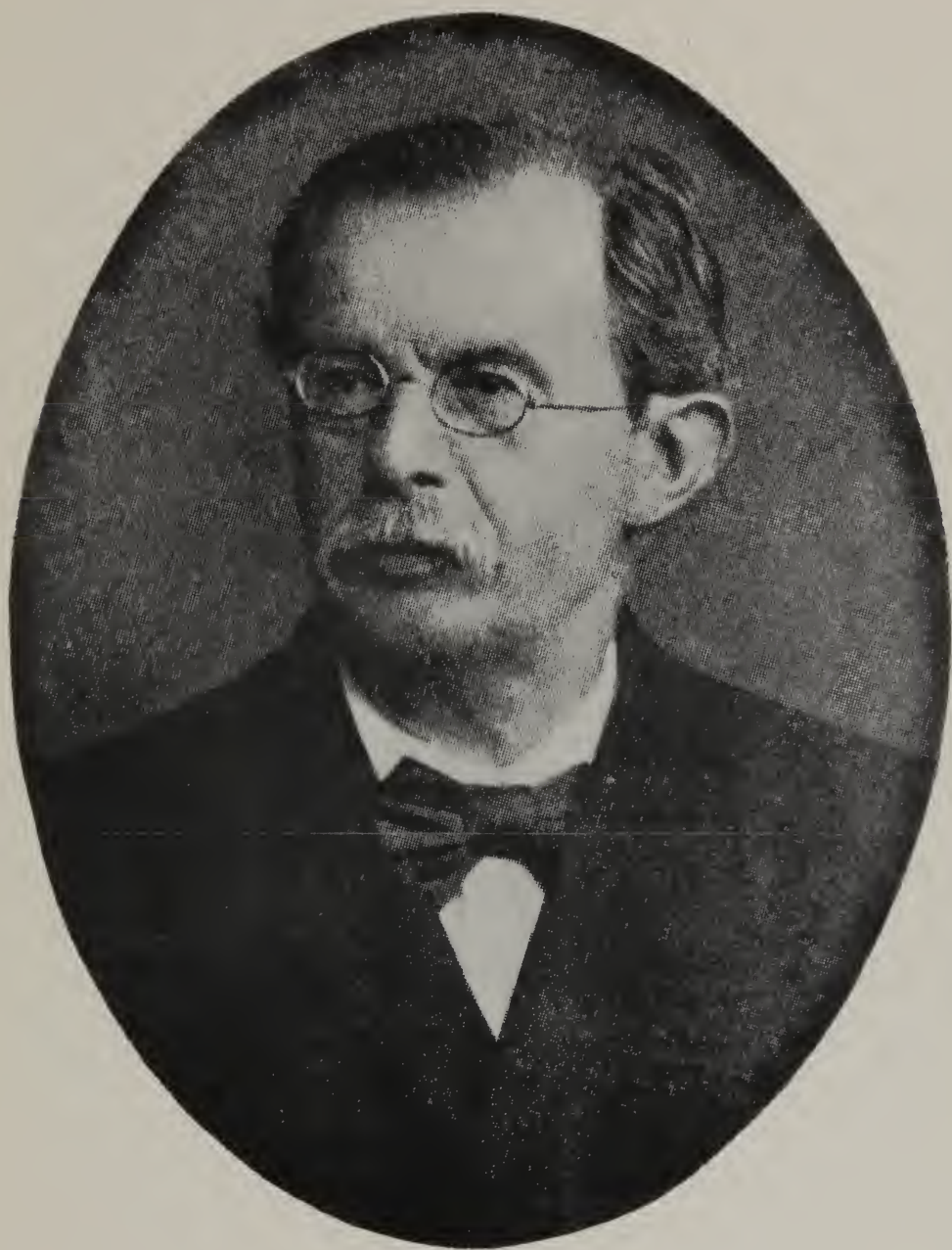
Born in Westphalia, Germany. Studied medicine in Bonn, Würzburg and Berlin, obtaining his degree in 1855, after which he pursued further studies in Berlin, Vienna, Rome and Paris. He returned to Berlin as an assistant to Virchow (1858) with whom he remained until accorded the chair of pathology at the University of Strassburg (1864). Here he was instrumental in calling to Strassburg such men as Golz, Leyden and Waldeyer. Among his pupils were Friedländer, Stilling and Aschoff.

His most important contribution was on the disease that bears his name (1882). He is also well known for his work on spina bifida (1886). His report on tuberous sclerosis in 1863 preceded Bourneville's by 17 years.

Selected References

Ueber die multiplen Fibrome der Haut und ihre Beziehung zu den multiplen Neuromen, Berlin, A. Hirschwald, 1882.

Untersuchungen ueber die Spina bifida, Berlin, G. Reimer, 1886.



CARL WERNICKE (1848-1905)

Born in Tarnowitz, Poland. Obtained medical degree at Breslau (1870). Became clinical assistant to Westphal at the Charité in Berlin (1876-78), and later received professorship in neurology and psychiatry (1885). He held similar chairs at Breslau (1890) and Halle (1904). A highly original thinker, he can be said to have been a pupil only of Meynert, though he was greatly influenced by the works of Hitzig and Munk.

His approach to psychiatry was through neuroanatomy and neuropathology, and in historical perspective he is to be classed with Griesinger and Meynert. He is best known for his work on sensory aphasia (1874) and polioencephalitis hemorrhagica superior (1881), both of which disorders bear his name. His treatise on disorders of the internal capsule also was significant (1875). His textbook on diseases of the nervous system is still a mine of information (1881).

Selected References

Der aphasische Symptomencomplex, Breslau, 1874.

Erkrankungen der inneren Kapsel, Breslau, Cohn & Weigert, 1875.

Lehrbuch der Gehirnkrankheiten, 3 vol., Kassel and Berlin, T. Fischer, 1881-83.

Gesammelte Aufsätze und kritische Referate zur Pathologie des Nervensystems, Berlin, T. Fischer, 1893.



ADOLF VON STRÜMPELL (1853-1925)

Born in Gut Neu-Autz, Latvia. Obtained degree in medicine at Leipzig (1875), where he became assistant to Wunderlich (1876). From 1879 he worked on pathologic anatomy under the direction of Flechsig and Weigert. He succeeded Erb as Professor of Internal Medicine at Leipzig (1883), subsequently held similar chairs in Erlangen (1886), Breslau (1903), and Vienna (1909), but returned to Leipzig (1910).

His best known work is that on pseudosclerosis (1898), on which Westphal had written in 1883 (Westphal-Strümpell disease). His textbook on pathology (1883-84) was regarded as the best in its day. His work on acute encephalitis (1884, 1891) was an expansion of that of Wernicke. He is well known also for his treatises on diseases of the spinal cord (1880) and the amyostatic symptom complexes (1915).

Selected References

Beiträge zur Pathologie des Rückenmarks, Arch. f. Psychiat. 10: 676-717, 1880.

Ueber primäre acute Encephalitis, Deutsche Arch. f. klin. Med. 47: 53-74, 1890.

Ueber Westphal'sche Pseudosklerose, und ueber diffuse Hirnsklerose, insbesondere bei Kinder, Deutsche Ztschr. f. Nervenhe. 12: 115-149, 1898.

Ein weiterer Beitrag zur Kenntniss der sog. Pseudosklerose, *ibid.* 14: 348-355, 1899.



CARL WEIGERT (1845-1904)

Born in Münsterberg, Germany. Obtained degree in medicine at Berlin (1866). Studied with Virchow, then Heidenhain, then Waldeyer, and in 1874 became assistant to Cohnheim at Breslau. Held chair of pathology at Leipzig (1879-94), after which he became Director of the Senckenberg Institute of Pathologic Anatomy at Frankfurt (1885), where in an unpretentious laboratory and without university connections he illumined many aspects of neuropathology.

He is best known among neuropathologists for his discovery of a method for staining myelin sheaths (1882), which opened up new avenues for the investigation of the nervous system. Another important contribution in this connection was his glia fiber stain (1890), which he employed intensively on normal and diseased cerebral cortex.

Selected References

Ueber eine neue Untersuchungsmethode des Centralnervensystems, Centralbl. f. d. med. Wissenschaft. 20: 753-757 et seq., 1882.

Zur Markscheidenfärbung, Deutsche med. Wehnschr. 17: 1184-1186, 1891.

Beiträge zur Kenntnis der normalen menschlichen Neuroglia, Festschr. z. fünfzigjährigen Jubiläum d. ärzt. Vereins zu Frankfurt, 1895.



FRANZ NISSL (1860-1919)

Born in Frankenthal, Germany. Took degree in medicine at Munich (1885), following which he became assistant to von Gudden. Became physician to the Irrenanstalt at Frankfurt (1889), then went to Heidelberg at Kraepelin's call (1896), and finally to the Deutsche Forschungsanstalt für Psychiatrie at Munich (1918). Worked in close collaboration with Alzheimer for nearly 25 years, first at Frankfurt and then at Heidelberg.

Discarded use of Muller's fluid as a fixative in favor of alcohol, which opened the way for the use of aniline stains—an advance of great significance which enabled him to lay the foundation of pathologic histology. His aniline staining method was announced in his prize-winning student thesis in 1885 (according to Spatz [1929] not available in print).

Selected References

Ueber die sogenannten Granula der Nervenzellen, *Neurol. Centrabl.* 13: 676-685 et seq., 1894.

Zur Histologie der paralytischen Rindenerkrankungen, *Hist. u. Histopath. Arb. (Nissl-Alzheimer)* 1: 315-494, 1902.

Die Neuronenlehre und ihre Anhänger. Ein Beitrag zur Lösung des Problems der Beziehungen zwischen Nervenzelle, Faser und Grau, Jena, G. Fischer, 1903.



ALOIS ALZHEIMER (1864-1915)

Born in Marktbreit, Germany. Received degree in medicine at Würzburg (1887). Joined staff of the Irrenanstalt at Frankfurt (1889), where he spent 14 years, succeeding Nissl in 1896. Joined Kraepelin at Heidelberg (1903) and after a few months accompanied him to Munich. Alzheimer remained there as Professor of Psychiatry until 1912, when he was called to the chair at Breslau.

He was one of the giants of the Munich School. His chief interest was the histopathology of the cerebral cortex, and it is to him and Nissl that credit goes for establishing the pathologic anatomy of mental disease. His study of the histopathology of general paresis was a classic (1904). He is equally well known for his work on cerebral arteriosclerosis (1894, 1898), presenile dementia (Alzheimer's disease) (1911), and Huntington's chorea (1911).

Selected References

Die arteriosclerotische Atrophie des Gehirns, Neurol. Centralbl. 13: 765-767, 1894.

Histologische Studien zur Differenzialdiagnose der progressiven Paralyse, Hist. u. Histopath. Arb. (Nissl-Alzheimer) 1: 18-314, 1904.

Ueber eigenartige Krankheitsfälle des späteren Alters, Ztschr. f. d. ges. Neurol. u. Psychiat. 4: 356-385, 1911.



WALTHER SPIELMEYER (1879-1935)

Born in Dessau, Germany. Obtained doctorate at Halle (1902). Became assistant to Hoche at Freiburg (1902), then Director of the Neuroanatomic Laboratory of the Psychiätrische Clinic in Munich (1912), where he later succeeded Alzheimer as head of the histopathologic division of the Forschungsanstalt für Psychiatrie (1917). Alzheimer's death in 1915 and Nissl's in 1919 left him to carry on the rich Munich tradition.

Stimulated by Nissl's contributions, he set out to improve histopathologic techniques, with abundant success (1909, 1911). Many important works flowed from his pen, including studies on anencephaly (1905), trypanosomiasis (1908), tuberous sclerosis (1913), peripheral nerve injuries (1915), and typhus (1919). His beautifully illustrated textbook on histopathology of the nervous system (1922) is as superb a work as one will find in the field.

Selected References

Die Trypanosomenkrankheiten und ihre Beziehungen zu des syphilitischen Nervenkrankheiten, Jena, G. Fischer, 1908.

Technik der mikroskopischen Untersuchungen des Nervensystem, Berlin, J. Springer, 1911.

Zur Klinik und Anatomie der Nervenschussverletzungen, Berlin, J. Springer, 1915.

Histopathologie des Nervensystems, Berlin, J. Springer, 1922.



MAX BIELSCHOWSKY (1869-1940)

Born in Breslau. Graduated in medicine at Munich (1893). When a pupil of Eninger at Frankfurt he came under the influence of Nissl (1894). Was assistant to Mendel in Berlin (1895-1904). Joined the staff of the Kaiser Wilhelm Institut für Hirnforschung at Buch near Berlin (1925). His latter days were spent in Amsterdam.

Devised silver staining method specific for neurofibrils (1902), which largely replaced Cajal's method on which it was based; it was the foundation on which Hortega and his pupils brought out in clear detail the neuroglia and microglia. In the neuropathologic field he is well known for his work on tuberous sclerosis (1913), the late infantile type of amaurotic family idiocy (1914, 1920), herpes zoster (1914), paralysis agitans (1920), Huntington's chorea (1923), and myotonia congenita (1923, 1929). His masterly exposition of present-day histopathology of the nervous system is to be found in Bunke-Foerster's *Handbuch der Neurologie* (1935).

Selected References

Die Silberimprägnation der Axencylinder, *Neurol. Centralbl.* 21: 579-584, 1902.

Herpes zoster. In *Handb. d. Neurol.* (Lewandowsky) 5: 316-341, 1914.

Zur Histopathologie und Pathogenese der amaurotischen Idiotie mit besonderer Berücksichtigung der zerebellaren Veränderungen, *J. f. Psychol. u. Neurol.* 26: 123-199, 1920.

Ueber Myotonia congenita, *ibid.* 38: 199-233, 1929.



ALFONS MARIA JAKOB (1884-1931)

Born in Aschaffenburg, Germany. Studied medicine at Munich, Berlin, and Strassburg, obtaining his degree at Strassburg (1908). After an assistantship to Alzheimer at Munich (1909), he became Prosektor (1914) and later Director (1924) of the Neuropathology Laboratory at the Staatskrankenanstalt Hamburg-Friedrichsberg.

So great was his reputation that he attracted many students. Among his more important works were those on Huntington's chorea (1920), syphilitic endarteritis (1920), and spastic pseudosclerosis (Jakob-Creutzfeldt disease) (1921). His crowning achievements were his work on diseases of the extrapyramidal system (1923) and his textbook on pathology of the nervous system (1927-29).

Selected References

Ueber eigenartige Erkrankungen des Zentralnervensystems mit bemerkenswertem anatomischen Befunde (Spastische Pseudosclerose-Encephalomyelopathie mit disseminierten Degenerationsherden), *Ztschr. f. d. ges. Neurol. u. Psychiat.* 64: 147-228, 1921.

Die extrapyramidalen Erkrankungen, Berlin, J. Springer, 1923.

Normal und pathologische Anatomie und Histologie des Grosshirns (mit besonderer Berücksichtigung der Histopathologie der Psychosen und extrapyramidalen Erkrankungen), 2 vol., Leipzig and Vienna, F. Deuticke, 1927-29.



NEUROPATHOLOGISTS
OF
AUSTRIA

LUDWIG TÜRCK (1810-1868)

Born in Vienna. After obtaining degree in medicine (1837), was appointed physician to the Allgemeinen Krankenhaus (1840). Found a stimulus in Ricord, whom he visited briefly in Paris in 1844.

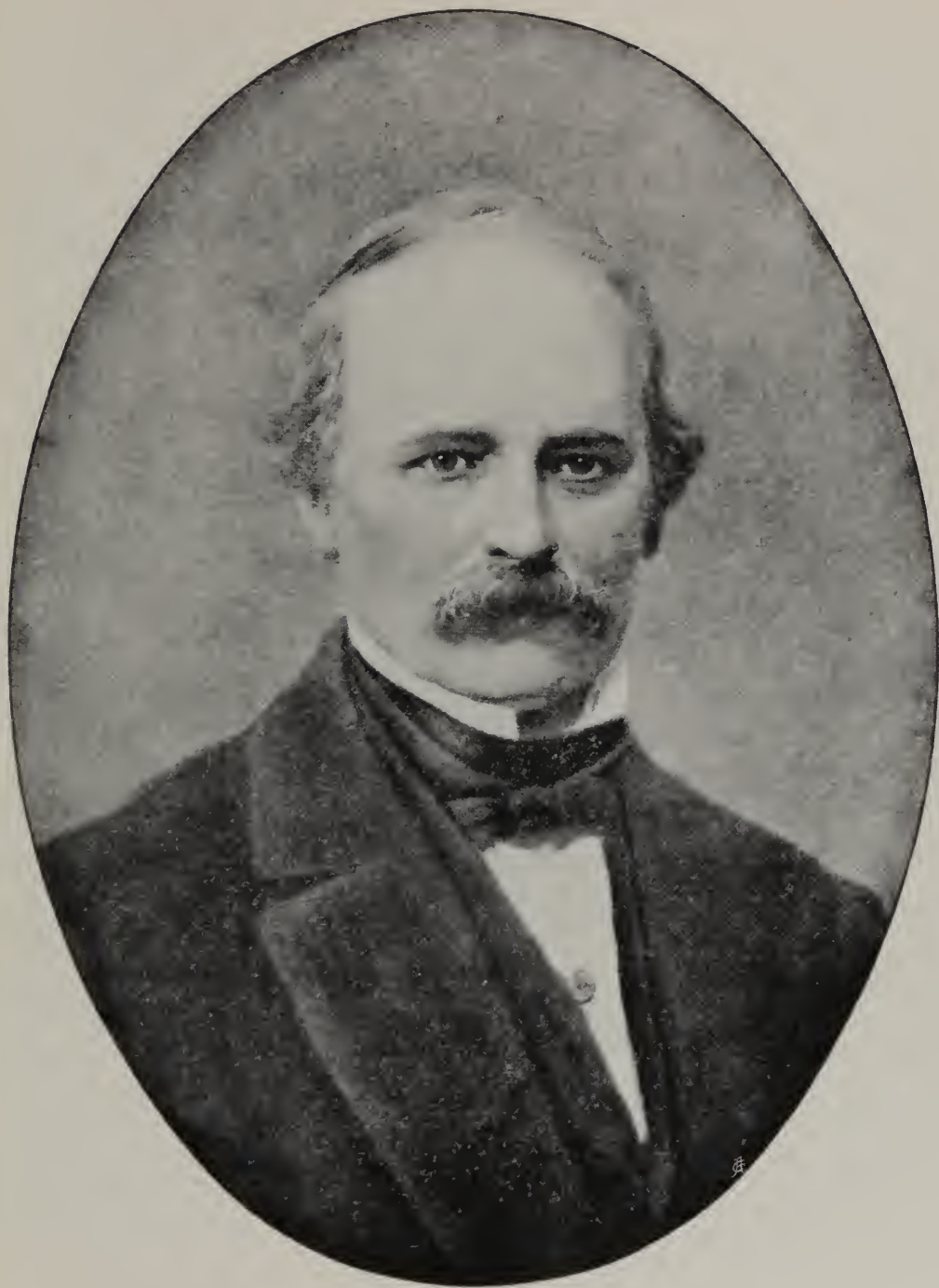
Apparently he was the first to perceive the significance of compound granular corpuscles (1849). Aided by Wedl and encouraged by Rokitansky, he began in 1851 to chart the course of neural pathways in the brain and spinal cord by tracing secondary degeneration. Thus, he was to the central nervous system what Waller had been to the peripheral nervous system. He above all others was responsible for opening the door to the study of system diseases. Bouchard, in his study of secondary tract degeneration (1866), and Flechsig, in his work on developmental myelination (1876), owed much to Türck's discoveries.

Selected References

Mikroskopischer Befund des Rückenmarkes eines paraplegischen Weibes, *Ztschr. der k. k. Gesellsch. der Aerzte zu Wien* 1: 173-176, 1849.

Vorläufig Mitteilung ueber die sogenannten Zwangsbewegungen nach Trennung gewisser Theile des Gehirnes, *ibid.* 1: 82-83, 1851.

Ueber sekundäre Erkrankung einzelner Rückenmarkstränge und ihrer Fortsetzungen zum Gehirne, *ibid.* 2: 511-534, 1852.



HEINRICH OBERSTEINER (1847-1922)

Born in Vienna. Obtained degree of medicine at Vienna (1870), where he studied under Brücke, Hyrtl, Skoda, and Billroth. Joined faculty of the University (1873) and ultimately became Hofrat in Neurology. Headed the newly founded Wiener Neurologische Institut (1882) to which students gathered from all corners of the earth.

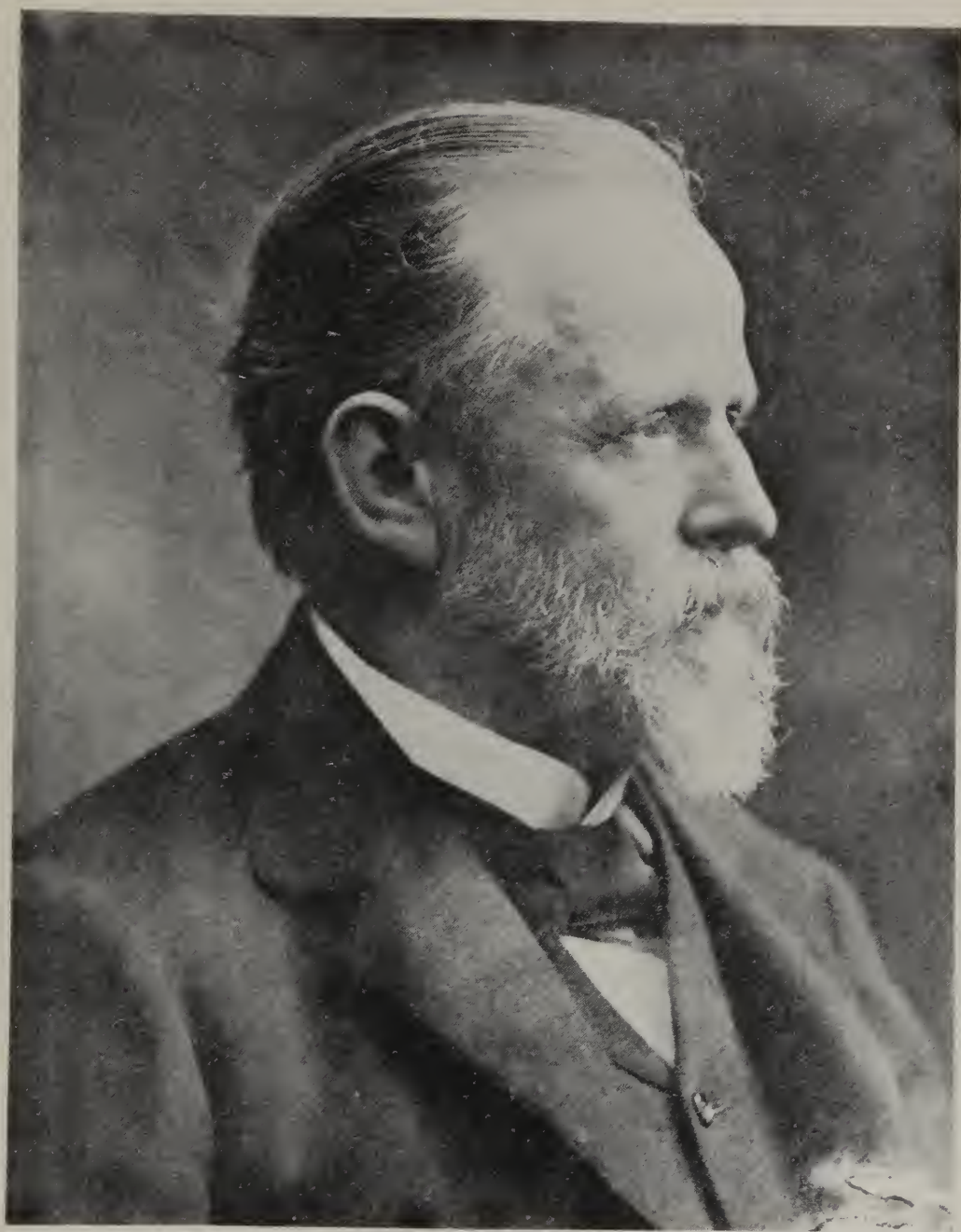
His attainments in the field of neuropathology were numerous. His textbook on neuropathology won him deserved recognition (1888). With his pupil Redlich, he demonstrated that tabes dorsalis is a disease of posterior roots (1894). His works on encephalodysplasia (1902) and general paresis (1908) were also of importance.

Selected References

Anleitung beim Studium des Baues der nervösen Centralorgane im gesunden und kranken Zustande, Leipzig and Vienna, Toeplitz & Deuticke, 1888.

Ueber Wesen und Pathogenese der tabischen Hinterstrangsdegeneration, Arb. a. d. Inst. f. Anat. u. Physiol. d. Centralnervensystems a. d. Wien. Univ. II Heft, 1894. Pp. 158-172. (with E. Redlich).

Die progressive allgemeine Paralyse, Vienna and Leipzig, A. Hölder, 1908.



EMIL REDLICH (1866-1930)

Born in Brunn, Czechoslovakia. Received degree of medicine at Vienna (1889). As a student he worked in neuroanatomy at the Allgemeinen Krankenhaus with Obersteiner. Became Privat-Dozent at the University (1894), assisting Wagner von Jauregg, then Director of the Privat-Irrenanstalt at Inzerdorf (1898), with title of Professor to the University (1900). Finally became Director of the Nervenheilanstalt Maria-Theresin-Schlössel in Vienna (1914).

His name is closely linked with pathology and pathogenesis of tabes dorsalis, sometimes in collaboration with his teacher Obersteiner (1892, 1897, 1907). He is usually credited as having been the first to describe senile plaques (1898). He is also well known for his work on syringomyelia (1892, 1896), multiple sclerosis (1896, 1904, 1909), and brain tumors (1906, 1908, 1912).

Selected References

Die hinteren Wurzeln des Rückenmarkes und die pathologische Anatomie der Tabes dorsalis, Arb. a. d. Inst. f. Anat. u. Physiol. d. Centralnervensystems a. d. Wien. Univ. I Heft, 1892. Pp. 1-52.

Die Pathologie der tabischen Hinterstrangserkrankung, Jena, G. Fischer, 1897.

Ueber miliare Sklerose der Hirnrinde bei seniler Atrophie, Jahrb. f. Psychiat. 17: 208-216, 1898.

Hirntumor. In Handb. d. Neurol. (Lewandowsky) 3: 547-642, 1912.



HERMANN SCHLESINGER (1866-1934)

Born in Pressburg, Czechoslovakia. Studied in Vienna, where he received his degree in medicine (1890). He then became a voluntary assistant in Nothnagel's clinic at the Allgemeinen Krankenhaus, and undertook work also with Meynert and Kaposi. It was through Obersteiner that he entered the field of neurology. In time he became Professor of Medicine to the Allgemeinen Krankenhaus (1908).

He made a number of important contributions to neuropathology, chief among them being his monograph on syringomyelia (1895). His work on spinal cord tumors, in which dermatomes were plotted, included the first description of meningitis serosa circumscripta (1898). His studies on herpes zoster (1919) and encephalitis (1920) also were of importance.

Selected References

Die Syringomyelie, Leipzig and Vienna, F. Deuticke, 1895.

Beiträge zur Klinik der Rückenmarks- und Wirbeltumoren, Jena, G. Fischer, 1898.

Zur Lehre vom Herpes zoster. I. Rückenmarksveränderungen bei Herpes zoster. II. Zur Klinik der Zostererkrankungen im höheren Alter, Arb. a. d. Neurol. Inst. a. d. Wien. Univ. 22: 171-189, 1919.



SIGMUND FREUD (1856-1939)

Born in Freyberg, Czechoslovakia. Was influenced by Goethe's "Die Natur" in his decision to study medicine. While still a student at the University of Vienna he worked in Brucke's laboratory, where histology of the nervous system was his chief interest. After graduation (1881) he pursued anatomic studies under Meynert (to 1882) at the Allgemeinen Krankenhaus. He qualified in neuropathology (1885), went to Paris, where he came under the tutelage of Charcot (1885-86). Returned to Vienna (1886), where ultimately he became Professor of Neuropathology to the University (1919).

His claim to distinction in the field of neuropathology lies in his work on cerebral diplegia, which Little had described clinically in 1862.

Selected References

Les diplégies cérébrales infantiles, *Rev. neurol.* 1: 177-183, 1893.

Ueber familiäre Formen von cerebralen Diplegien, *Neurol. Centralbl.* 12: 512-515 et seq., 1893.

Die infantile Cerebrallähmung, Vienna, A. Hölder, 1897.



CONSTANTIN VON ECONOMO (1876-1931)

Born in Trieste (then Austrian). During course in medicine at Vienna he came under the influence of Obersteiner and Exner. After receiving his doctorate (1900), he studied with Magnan in Paris and with Kraepelin in Munich, but soon returned to Vienna to work with Nothnagel and Pal. He became assistant to Wagner von Jauregg, and subsequently Professor of Neurology and Psychiatry to the University (1921).

One of the most brilliant of the Austrian neurologists, he is best known for his contributions on lethargic encephalitis, the first of which appeared in 1917. Other important works included those on Wilson's disease (1918) and the nature of sleep (1925, 1926, 1929).

Selected References

Encephalitis lethargica, Wien. klin. Wchnschr. 30: 581-585, 1917.

Neue Beiträge zur Encephalitis lethargica, Neurol. Centralbl. 36: 866-878, 1917.

Wilson's Krankheit und das Syndrôme du corps strié, Ztschr. f. d. ges. Neurol. u. Psychiat. 43: 173-209, 1918.

Die Encephalitis lethargica. Ihre Nachkrankheiten und ihre Behandlung, Berlin, Urban & Schwarzenberg, 1929.



PAUL FERDINAND SCHILDER (1886-1940)

Born in Vienna. Obtained medical degree at Vienna (1909), where Obersteiner was one of his teachers. Became assistant to Anton at the psychiatric clinic of the University of Halle (1909), a school rich in the traditions of Meynert and Wernicke. He then went to Leipzig (1912), remaining there until called to Vienna by Wagner von Jauregg (1918). A decade later he came to the United States (1930). Here he became Clinical Director of the Psychopathic Division at Bellevue Hospital and Associate Professor in Psychiatry at the New York University Medical College (1940).

Aside from his preeminence as a psychiatrist and neurologist, his contributions to neuropathology were outstanding. He is particularly noted for his classical work on encephalitis periaxialis diffusa (1912), since known as Schilder's disease.

Selected References

Zur Kenntnis der sogenannten diffusen Sklerose. (Ueber Encephalitis periaxialis diffusa), *Ztschr. f. d. ges. Neurol. u. Psychiat.* 10: 1-60, 1912.

Zur Frage der Encephalitis periaxialis diffusa (sogenannte diffuse Sklerose), *ibid.* 15: 359-376, 1913.



NEUROPATHOLOGISTS
OF
FRANCE

JEAN MARTIN CHARCOT (1825-1893)

Born in Paris. Began internship at Salpetriere (1844). Became chief of the clinic at Salpêtrière (1862), then Professor of Pathologic Anatomy, succeeding Vulpian (1872). The chair of nervous diseases of the University of Paris was created from him in 1882. His pupils at Salpêtrière included von Bechterew and Marinesco, and among his internes were Bouchard, Pierre Marie and Babinski.

His complete works in 9 volumes testify to the brilliance and originality of his contributions. In his work on cerebral localization (1876), he gave to French neurology the anatomo-clinical method and the idea of localization. Regarded as classics were his works on amyotrophic lateral sclerosis (Maladie de Charcot) (1865, 1869), multiple sclerosis (1868, 1869), and the neuritic form of progressive muscular atrophy (Charcot-Marie-Tooth) (1886). With Bouchard he first fully described miliary aneurysms of the circle of Willis (1868).

Selected References

Sclérose des cordons latéraux de la moëlle chez une femme hystérique etc., *Gaz. d. Hôp.* (Paris) 38: 93, 1865.

Histologie de la sclérose en plaques, *ibid.* 41: 554-555 et seq., 1868.

Sur une forme particulière d'atrophie musculaire progressive souvent familiale, *Rev. de Méd.* 6: 97-138, 1886. (with Pierre Marie).



PIERRE MARIE (1853-1940)

Born in Paris. Studied medicine in Paris, interned under Bouchard (1881), and received his doctorate in 1883. Entered Salpêtrière (1885), where he became a close collaborator of Charcot. Chosen Professor of the Faculty of Medicine at Paris (1889) and subsequently Professor of Pathologic Anatomy of the Faculty (1907). His chief works were carried out at the Bicêtre, where among his pupils were Achúcarro, Marinesco, Kinnier Wilson and Guillain.

Much that was new in the field of neuropathology came from his pen. With Charcot he described a neuritic form of progressive muscular atrophy (1886). His work on acromegaly was classical (1886, 1889, 1891). His "bull in the china shop" dissertation on aphasia (1906) led to a re-evaluation of Broca's and Wernicke's views. Also outstanding was his book on diseases of the spinal cord (1892), and his studies on hereditary cerebellar ataxia (1893) and lacunar degeneration of the brain (1901).

Selected References

Leçons sur les maladies de la moelle, Paris, G. Masson, 1892.

Des foyers lacunaires de désintégration et de différents autres états cavitaires du cerveau, *Rev. de Méd.* 21: 281-298, 1901.

Revision de la question de l'aphasie: la troisième circonvolution frontale gauche ne joue aucun rôle spécial dans la fonction du langage, *Semaine Méd.* 26: 241-247, 1906.



JULES JOSEPH DEJERINE (1849-1917)

Born in Geneva, Switzerland. Studied medicine in Paris under Vulpian (1872), and on receiving his doctorate (1879) became Chief of the Clinic at the Bicêtre (1887). In 1895 he joined the staff of the Salpêtrière, and in 1919 succeeded to the chair which had been held, in turn, by Vulpian, Charcot, and Raymond.

There is scarcely a chapter in neuropathology to which he did not make important contributions. In his Thèse de Paris, on ascending paralysis, he was among the first to describe lesions in the spinal roots (1879). His description of peripheral neuro-tabes was a classic (1883). Other great contributions were on labio-glossal-laryngeal paralysis (1883), progressive muscular atrophy (1884-1886), progressive hypertrophic interstitial neuritis (Dejerine-Sottas disease) (1893, 1906), and olivopontocerebellar atrophy (ataxia of Dejerine-Thomas) (1900).

Selected References

Sur le névro-tabes périphérique (ataxie locomotrice) par névrites périphériques, avec intégrité absolue des racines postérieures, des ganglions spinaux et de la moelle épinière, *Comp. rend. de l'Acad. de Sc.* 97: 914-916, 1883.

Sur la névrite interstitielle, hypertrophique et progressive de l'enfance, *Comp. rend. Soc. de biol.* 5: 63-96, 1893. (with J. Sottas).

L'atrophie olivo-ponto-cérébelleuse, *Nouv. Iconog. de la Salpêtrière* 13: 330-370, 1900. (with A Thomas).



DÉSIRÉ MAGLOIRE BOURNEVILLE (1840-1909)

Born in Garencières, France. Studied medicine at Paris, and served as interne at Bicêtre, Salpêtrière, St. Louis, and Pitié Hospitals, graduating in 1870. Was student of Claude Bernard and associate of Charcot and Delasiauve. Became chief physician in pediatrics at Bicêtre (1879), and from 1905 headed the Foundation Vallée for the Study of Feeble-minded Children.

Was recognized as the leading continental authority on all aspects of mental abnormality of children. Most of his neuropathologic work was on idiocy. His description of tuberous sclerosis, since known as Bourneville's disease, appeared in 1880.

Selected References

Contribution a l'étude de l'idiotie, Arch. de Neurol. 1: 69-91, 1880.

Contribution a l'étude de la démence épileptique, *ibid.* 1: 213-256, 1880. (with H. D'Olier and E. Brissaud).

Contribution a l'étude de l'idiotie, *ibid.* 1: 391-412, 1880. (with E. Brissaud).



NEUROPATHOLOGISTS
OF
ENGLAND

AUGUSTUS VOLNEY WALLER (1816-1870)

Born in Kent, England. Studied in Paris, where he received his degree in medicine (1840). Was admitted as a licentiate to the Society of Apothecaries in London (1841). Moved to the University of Bonn (1851), and then to Paris, where he worked in Flourens' laboratory at the Jardin des Plantes (1856). Returned to England to the chair of physiology at Queen's College, Birmingham (1858). His latter years were spent in Switzerland.

His chief claim to distinction is his observation that the fibers of peripheral nerves degenerate when cut off from their cell bodies (1850). This discovery, since called Wallerian degeneration, opened the door to an immense number of pathologic studies on the peripheral nervous system.

Reference

Experiments on the section of the glossopharyngeal and hypoglossal nerves of the frog, and observations of the alterations produced thereby in the structure of their primitive fibers, *Phil. Trans. Roy. Soc., London* 1: 423-529, 1850.



JOHN HUGHLINGS JACKSON (1835-1911)

Born in Green Hammerton, York, England. Apprenticeship at York Medical School qualified him as physician (1855), after which he studied at St. Bartholomew's Hospital. Influenced by Jonathan Hutchinson and Brown-Séquard, he turned to neurology (1859), in the pursuit of which he spent much time as physician to the National Hospital, Queen Square, London (1862-1906) and to the London Hospital (1863-94).

He was a "compounder of ideas and percepts rather than a classifier of facts in the sense of the nosology of French neurology." He is best known for his contributions to the problems of aphasia (1864), his work on epilepsy (1870, 1875, 1888) (the form named after him was described in 1870), and his enunciation of the doctrine of functional levels in the nervous system (1898). Arnold Pick called him "the deepest thinker of neuropathology of the last century." His students and followers included Henry Head, James Collier, Kinnier Wilson and Gordon Holmes.

Selected References

Loss of speech with hemiplegia on the left side—valvular disease—epileptiform seizures affecting the side paralyzed, *Med. Times & Gaz.* 50: 166-167, 1864.

A study of convulsions, *Trans. St. Andrew's Med. Grad. Assn.* 3: 162-204, 1870.

Relation of convulsion to loss of consciousness, etc., *Brit. M. J.* 1: 773-774, 1875.



SIR EDWARD FARQUHAR BUZZARD (1871-1945)

Born in London. Studied medicine at St. Thomas' Hospital. Was consulting physician to the Royal Free Hospital and the National Hospital, Queen Square, London. Became Regius Professor of Medicine at Oxford University, and consulting physician to St. Thomas' Hospital (1928).

In the field of neuropathology he is well known for his textbook in collaboration with Greenfield (1921), and for his work on diseases of the spinal cord in Osler's *Modern Medicine* (1910). Important also were his studies on myasthenia gravis (to which he contributed the term, lymphorrhages) (1905), chronic progressive cerebral softening (1906), acute infective and toxic conditions of the nervous system (1907), delayed traumatic apoplexy (1909), and epidemic encephalitis (1919).

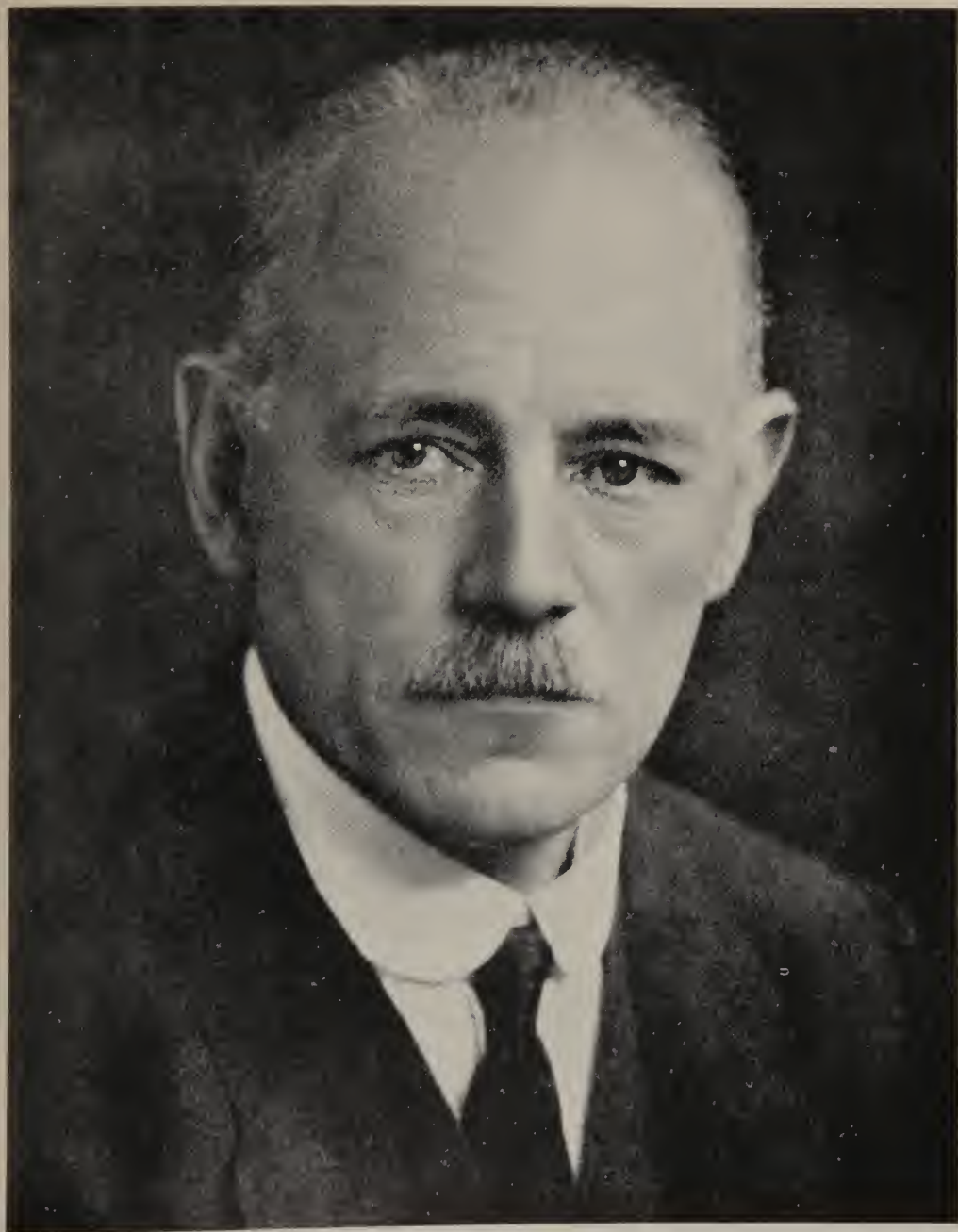
Selected References

The clinical history and post-mortem examination of five cases of myasthenia gravis, *Brain* 28: 438-483, 1905.

On certain acute infective or toxic conditions of the nervous system (the Goulstonian lectures), *Brain* 30: 1-100, 1907.

Epidemic encephalitis, *Brain* 42: 305-338, 1919. (with J. G. Greenfield).

Pathology of the nervous system, London, Constable and Co., Ltd., 1921. (with J. G. Greenfield).



SAMUEL ALEXANDER KINNIER WILSON (1878-1937)

Born in New Jersey. Received degree in medicine at Edinburg (1902), and then studied with Pierre Marie and Babinski in Paris (1903). Held posts, including one as Resident Pathologist (1913), at National Hospital, Queen Square, London (from 1904), where he owed much to his contacts with Gowers, Bastian, Horsley and Jackson.

Although essentially a clinician with the power of lucid exposition, he contributed greatly to the field of neuropathology. His classic paper on progressive lenticular degeneration (1912), since called Wilson's disease, was the impetus for renewed investigation of the normal and morbid physiology of the basal ganglia. Many other subjects were elucidated by his facile pen, among them apraxia (1908) epidemic encephalitis (1918), and aphasia (1926, 1931). His posthumous text book on neurology was the greatest since Oppenheim's.

Selected References

Progressive lenticular degeneration: a familial nervous disease associated with cirrhosis of the liver, *Brain* 34: 295-509, 1912.

Progressive lenticulare Degeneration und ihre Zusammenhang mit dem Symptomenkomplex und der pathologischen Physiologie des Corpus striatum. In *Handb. d. Neurol.* (Lewandowsky) 5: 951-990, 1914.

Neurology, 2 vols., Baltimore, Williams & Wilkins, 1940.



NEUROPATHOLOGISTS
OF
ITALY

CAMILLO GOLGI (1843-1926)

Born in Cortena, Italy. Graduated in medicine at Pavia (1865), and became assistant to Lombroso (1868). Students crowded his laboratory at Pavia, among them Negri, Nansen and Kölliker. He received the Nobel prize jointly with Cajal in 1906.

His earlier works were on pellagra (1868) and psammomas (1869). Making use of material hardened in a solution of potassium bichromate or osmic acid, he was able better to stain the neuroglia (1870-1871). His epoch-making silver chromate staining method, *la reazione nera*, was first described briefly in 1873 and 1874. Studies on gliomas followed (1875), and his magnificently illustrated work on the finer histology of the nervous system, together with a full description of his techniques, appeared in 1885-86.

Selected References

Sulla struttura della sostanza grigia del cervello, *Gaz. med. ital. lombard.*, Milano 33: 244-246, 1873.

Sui gliomi del cervello, *Riv. sper. di fren. et di med. leg.* 1: 66-78, 1875.

Sulla fina anatomia degli organi centrali del sistema nervoso, Milano, U. Hoepli, 1885-86.



VITTORIO MARCHI (1851-1908)

Born in Novellara, Italy. Received his degree in medicine at Modena (1882). Worked with Golgi at Pavia (1883-84) and with Luciani in Florence (1885). Was called to chair of histology at the University of Palermo (1887), but left the University (1890) to establish a laboratory for clinical microscopy and a neurological service at the hospital in Jesi, where he remained.

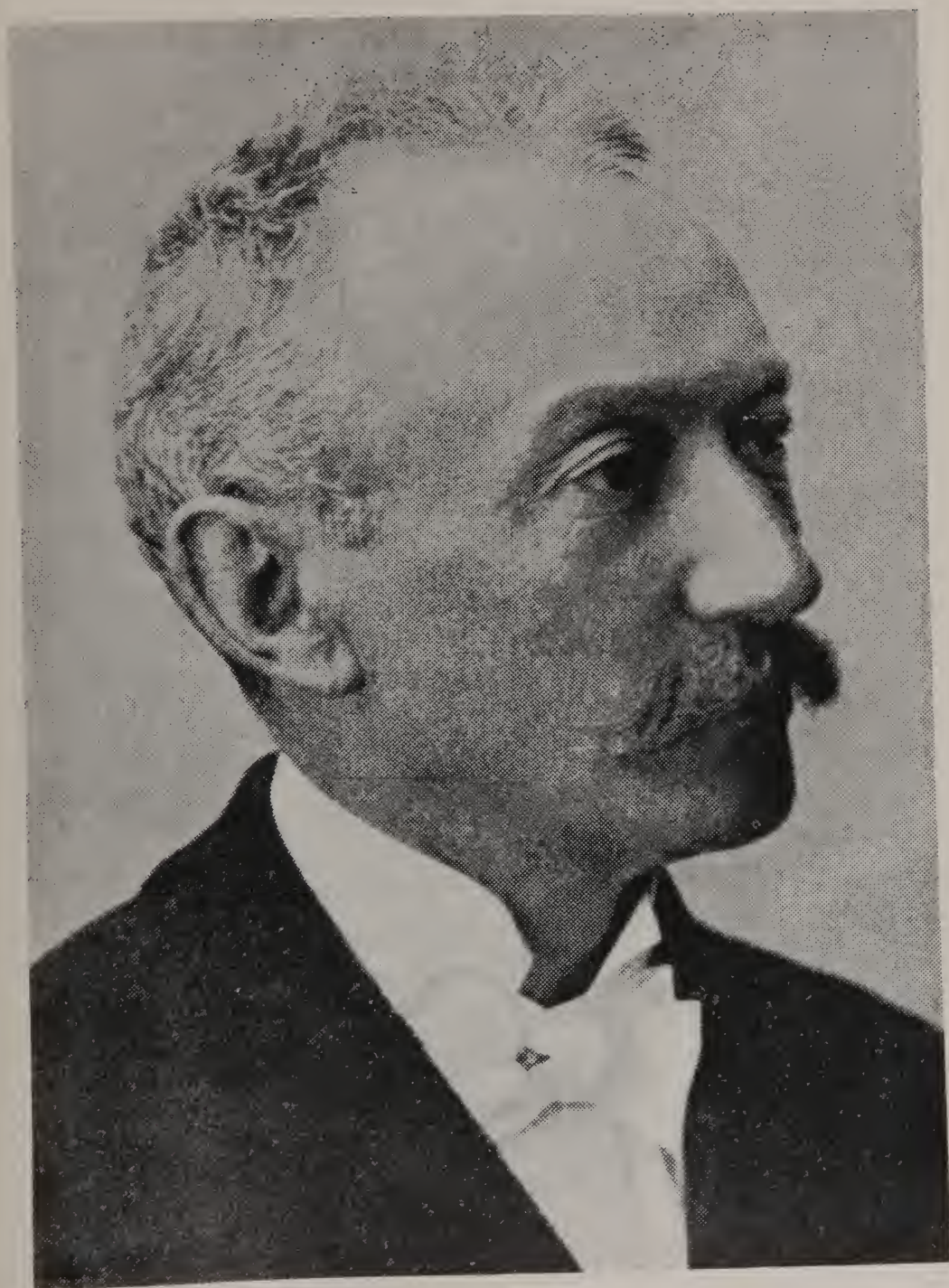
His development of an osmic acid staining method for detecting degenerated myelin sheaths (1886), a discovery which ranks with Golgi's silver chromate method (1873), opened the way to many subsequent investigations of the nervous system. Of his other scientific works he is best known for his anatomic studies on the cerebellum (1886), based on his new staining method, and for his work on general paresis (1883).

Selected References

Sulle degenerazioni discendenti consecutive a lesioni sperimentali di diverse zone della corteccia cerebrale, Riv. sper. di fren. e. di med. leg. 12: 208-252, 1886. (with G. Algeri).

Sulle degenerazioni consecutive all'estirpazioni totale e parziale del cervelletto, Nota prev. dal. Lab. di Fesiol. del R. Ist. di Studi Sup. di Firenze diretto dal Prof. Luciani, 1886.

Sull'origine e decorso dei peduncoli cerebelli e sui loro rapporti cogli altri centri nervosi, Firenze, Monnier, 1891.



GIOVANNI MINGAZZINI (1859-1929)

Born in Ancona, Italy. Graduated in medicine at Rome (1883), after which he studied with von Gudden at Munich. Became director of laboratory of pathologic anatomy (1891), then director of the school of neuropathology at the University of Rome (1895).

His contributions, numbering 184, dealt with many aspects of anatomy and pathology of the nervous system. His work on lenticular degeneration appeared in the same year as Wilson's (1912). Highly important was his monograph on the corpus callosum (1922). His work on aphasia opened the way toward revision of fundamental concepts of the disorder (1907, 1910, 1924). He is well known also for his studies on encephalitis lethargica (1921), apasias (1918, 1924), and brain tumors (1913, 1927).

Selected References

Das Linsenkernsyndrom. Klinische und anatomisch-pathologische Beobachtungen, *Ztschr. f. d. ges. Neurol. u. Psychiat.* 8: 85-106, 1912.

Der Balkan. Eine anatomische, physiopathologische und klinische Studie, Berlin, J. Springer, 1922.

Klinischer und pathologisch-anatomischer Beitrag zum Studium der Aplasiae cerebro-cerebellospinales, *Ztschr. f. d. ges. Neurol. u. Psychiat.* 90: 521-572, 1924. (with F. Giannuli).



ADELCHI NEGRI (1876-1912)

Born in Perugia. Pursued medical studies at Pavia, where he was student assistant to Golgi (1900). Qualified in pathology (1905), and headed the Department of Microbiology at Pavia (1909).

Ten years of his life were spent in the study of rabies in dogs, rabbits, and man. His first work in which the intracytoplasmic inclusions named after him were described, appeared in 1903.

Reference

Contributo allo studio dell'eziologia della rabbia, Boll. della Soc. Med.-Chir. d. Pavia, 1903. Pp. 88-104.



GAETANO PERUSINI (1879-1915)

Born in Udina, Italy. Obtained medical degree at Rome (1901), and became assistant in the clinic of nervous and mental diseases of the University. Was a distinguished pupil of Nissl and Alzheimer, in whose laboratories he did much of his best work.

To be counted among his most important contributions are those on the pathologic anatomy of various mental diseases, especially infantile-juvenile paresis (1904), tuberous sclerosis (1906), and presenile dementia (sometimes called Alzheimer-Perusini's disease) (1909).

Selected References

Sopra un caso di paralisi progressiva infanto juvenilis simulante la sindrome data da un-atrofia cerebello spinale, *Ann. dell'Ist. psych. dell'Univ. di Roma* 3: 153-202, 1904.

Ueber einen Fall von Sklerosis tuberosa hypertrophica (Isticoatipia corticale disseminata von Pellizzi), *Monatschr. f. Psychiat. u. Neurol.* 17: 169-192 et seq., 1906.

Ueber klinisch und histologisch eigenartige psychische Erkrankungen des spaeteren Lebensalters, *Hist. u. Histopath. Arb. (Nissl-Alzheimer)* 3: 297, 1909.



NEUROPATHOLOGISTS

OF

SPAIN

SANTIAGO RAMÓN Y CAJAL (1852-1934)

Born in Petilla, Spain. Received degree in medicine at Zaragoza (1873). Held chairs in anatomy at Zaragoza (1874) and Valencia (1884), and in normal and pathologic histology at Barcelona (1887), and then accepted chair in normal histology and pathological anatomy at Madrid (1892), where he remained.

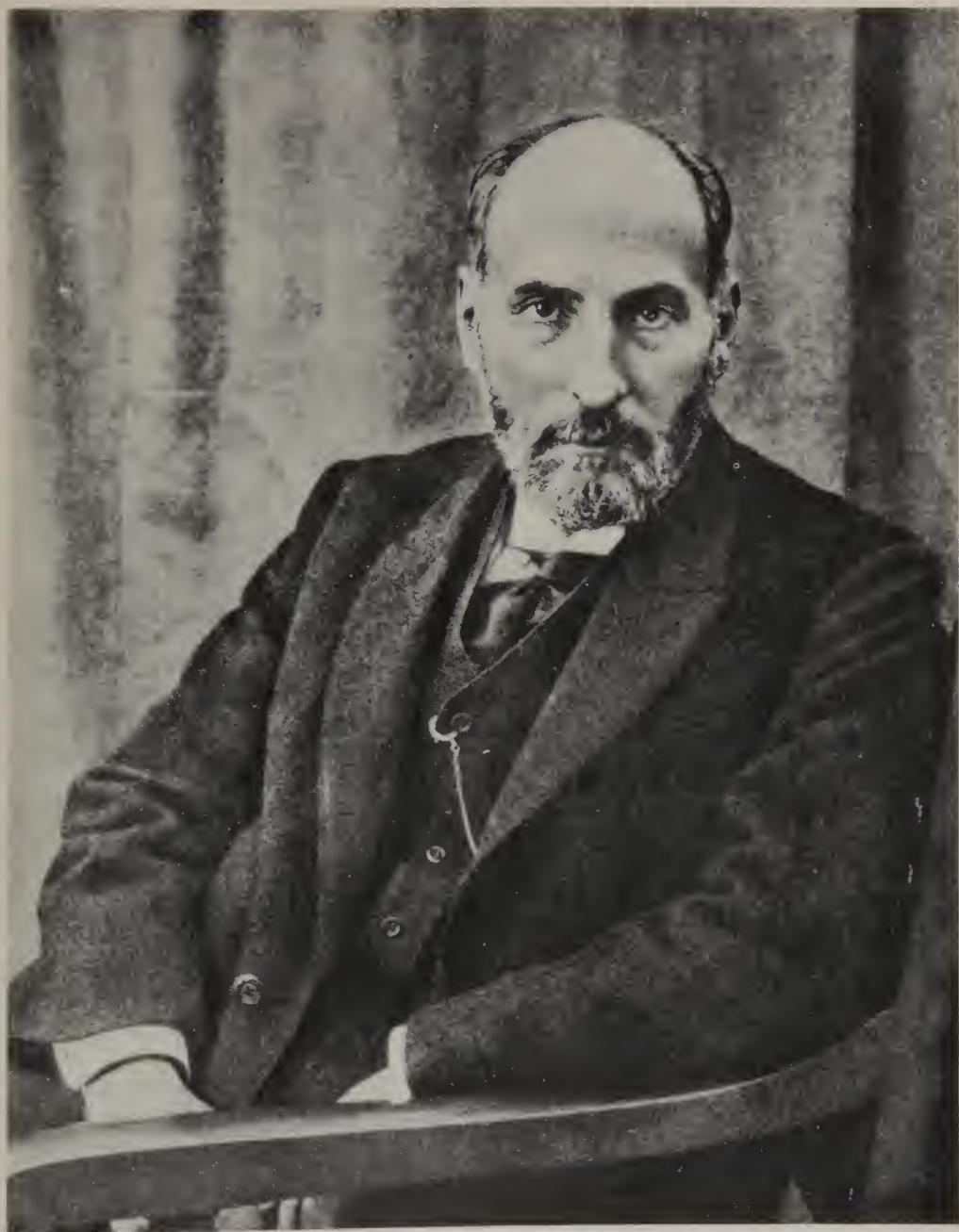
Improving on the silver-chromate stain which Golgi had introduced 15 years earlier, Cajal, in 1888, set out methodically to explore the finer aspects of the entire brain. Neurons and their connections were even better demonstrated when in 1903 he perfected his reduced silver nitrate technique. Then in 1913 his monumental work on astrocytes, made possible by his gold chloride-mercury bichloride method, appeared. His still unrivaled work on degeneration and regeneration in the nervous system occupied much of his later life.

Selected References

Sobre un sencillo proceder de impregnación de las fibrillas interiores del protoplasma nervosa, Arch. lat. de med. y de biol., Madrid 1: 3-8, 1903.

Sobre un nuevo proceder de impregnación de la neuroglia y sus resultados en los centros nerviosos del hombre y animales, Trab. d. lab. de invest. biol. de la Univ. Madrid 11: 219-237, 1913.

Degeneration and regeneration of the nervous system, 2 vol., Trans. by Raoul M. May, London, Oxford University Press, 1928.



NICOLÁS ACHÚCARRO (1881-1918)

Born in Bilbao, Spain. After preliminary medical studies at Madrid, he worked with Pierre Marie in Paris (1901-02), with Kraepelin and Alzheimer in Munich, and with Lugaro in Florence. Obtained medical degree in Madrid (1906). Became Director of the Laboratory of St. Elizabeth's Hospital, Washington, D. C. (1908), and after two years returned to Madrid to become Cajal's favorite disciple and Hortegea's teacher.

His development of the silver tannate staining method was one of his outstanding achievements (1911). Among his more important neuropathologic works were those on rabies (1909), general paresis (1911, 1912, 1914), functions of the neuroglia (1909, 1913, 1915), brain tumors (1912, 1913), and Alzheimer's disease (1914).

Selected References

Zur Kenntniss der pathologischen Histologie des Zentralnervensystems bei Tollwut, *Hist. u. Histopath. Arb. (Nissl-Alzheimer)* 3: 143-199, 1909.

Algunos resultados histopatológicos obtenidos con el procedimiento del tanino la plata amoniacal, *Trab. d. lab. d. invest. biol. de la Univ. Madrid* 9: 269-288, 1911.

Notas sobre la estructura y funciones de la neuroglia y en particular de la neuroglia de la corteza cerebral humana, *ibid.* 11: 187-217, 1913.



PÍO DEL RÍO-HORTEGA (1882-1945)

Born in Portella, Spain. Studied medicine at Valladolid (1898-1905), and obtained doctorate in Madrid (1908). Became a member of Cajal's staff, working in close association with Achúcarro, Tello, Lafora and de Castro. His latter days were spent in Buenos Aires with Polak.

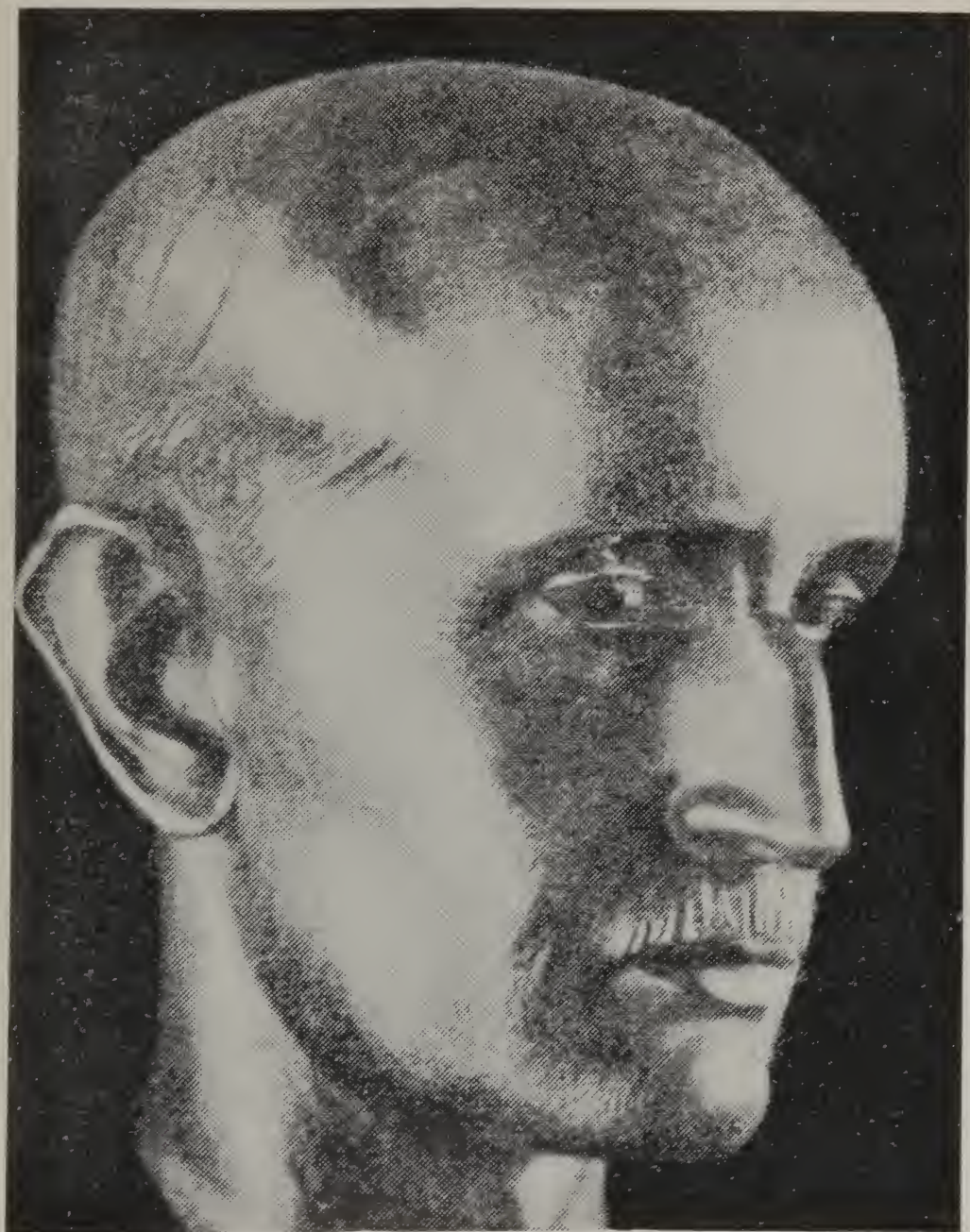
He set to work on determining the nature of Cajal's "third element." In 1917 he described his new ammoniacal silver carbonate method (an adaptation of Bielschowsky's stain), and in 1919-21 announced that the element consisted of 2 types of cell, to which he gave the names, microglia and oligodendroglia. His classical work on the histogenesis of microglia appeared in 1921. He turned to pathology in the early 1930s, doing important work on meningeal and brain tumors.

Selected References

Noticia de un nuevo y fácil método para la coloración de la neuroglia y del tejido conjuntivo, Trab. d. lab. de invest. biol. de la Univ. Madrid 15: 367-378, 1917.

Histogénesis y evolución normal; éxodo y distribución regional de la neuroglia, Arch. de neurobiol. 2: 212-255, 1921.

Anatomía microscópica de los tumores del sistema central y periférico, Trab. del lab. de histopat. de la Junta para ampliación de estudios, 1933.



NEUROPATHOLOGISTS

OF

HOLLAND

CORNELIS WINKLER (1855-1941)

Born in Sianen a. d. Lek, Holland. Graduated in medicine from the University of Utrecht (1879). Became assistant physician at Haag (1878) and assistant to Talma (1881). Moved to Utrecht (1885), and received chair in neurology and psychiatry (1891). Later held similar position in Amsterdam (1896), and subsequently returned to Utrecht (1915). His students included Brouwer, Ariëns-Kappers, Bouman, and Dusser de Barenne.

Although essentially an anatomist, physiologist and neurologist, he contributed significantly to the field of neuropathology. Outstanding works are those on beriberi (1887), aphasia (192), spinal cord hemorrhage (1908), amaurotic family idiocy (1913), cerebellar aplasia (1923), and olivopontocerebellar atrophy (1923).

Selected References

Mittheilung ueber die Beri-Beri, Deutsche med. Wchnschr. 13: 845-848, 187.

Zur Kenntnis der traumatischen Rückenmarksaffektionen (Haematomyelie, Myelorhexis), Deutsche Ztschr. f. Nervenhe. 35: 222-292, 1908. (with Jochmann).

Das Gehirn eines amaurotisch-idioten Mädchens, Amsterdam, J. Müller, 1913. (with J. van Gilse-van Wert).

A case of olivo-pontocerebellar atrophy and our conception of neo- and palαιο-cerebellum, Schweiz. Arb. f. Neurol. u. Psychiat. 13: 684-702, 1923.



LEENDERT BOUMAN (1869-1936)

Born in Nieuw-Beijerland, Holland. Obtained degree in medicine at Amsterdam (1895); then worked with Krafft-Ebing and Wagner von Jauregg in Vienna. Some years later he visited the laboratories of Kraepelin and Alzheimer in Munich (1905). Held chair of psychiatry and neurology at Amsterdam, and later succeeded Winkler at Utrecht (1925).

A neuropathologist of considerable magnitude, he is best known for his studies on encephalitis periaxialis diffusa (1924, 1934) and postvaccinal encephalitis (1927). His atlas on histopathology of the central nervous system, with Bok (1932), is evidence of his versatility and technical skill.

Selected References

Encephalitis periaxialis diffusa, *Brain* 47: 453-488, 1924.

Die Histopathologie der Encephalitis post vaccinationem, *Ztschr. f. d. ges. Neurol. & Psychiat.* 111: 495-510, 1927. (with S. T. Bok).

Diffuse sclerosis (encephalitis periaxialis diffusa), Bristol, J. Wright and Sons, Ltd., 1934.

Histopathology of the central nervous system, Utrecht, A. Oosthoek, 1932. (with S. T. Bok).



NEUROPATHOLOGISTS
OF
SWEDEN

SALOMON EBERHARD HENSCHEN (1847-1930)

Born in Upsala, Sweden. Studied in Stockholm, where Malmsten and Retzius were among his teachers; then worked with Ludwig at Leipzig. Returned to Upsala in 1880, obtaining his doctorate, and again returned to Germany, to work with Cohnheim and Weigert. Held chairs in medicine at Upsala (1882) and Stockholm (1900).

He turned more and more to neuropathology, with particular emphasis on localization of visual pathways in the brain. His many works on this subject, from 1887 to 1923, in which he culled as many as 1,000 cases from the literature to support his personal observations and his theory of retinal representation in the cortex, brought him world-wide recognition. He also contributed greatly to the knowledge of aphasia (1920-22) and of olfactory, gustatory and auditory centers in the brain (1918, 1919, 1923).

Selected References

- Ueber die Hörsphäre, *Jahrb. f. Psychol. u. Neurol.* 22: 319-474, 1918.
- Ueber die Geruchs- und Geschmackszentren, *Monatschr. f. Psychiat. u. Neurol.* 45: 121-165, 1919.
- 40 jähriger Kampf um das Sehzentrum und seine Bedeutung für die Hirnforschung, *Ztschr. f. d. ges. Neurol. u. Psychiat.* 87: 505-535, 1923.



OTTO IVAR WICKMAN (1872-1914)

Born in Lund, Sweden. Studied medicine at Lund and Stockholm, receiving his degree from the University of Stockholm (1906). Began work at the Institute of Pathologic Anatomy in Helsingfors (1907), but soon went to Berlin to study with Oppenheim, thence to Paris to engage in neurologic and pediatric studies, after which he spent 3 years as an assistant to Czerny in Breslau and Strassburg. Returned briefly to Stockholm.

Virtually his entire effort was devoted to the study of poliomyelitis in all its aspects. His histopathologic work on the subject was classical.

Selected References

Studien ueber Poliomyelitis acuta. Zugleich ein Beitrag zur Kenntnis der Myelitis acuta, Arb. a. d. path. Inst. d. Univ. Helsingfors 1: 109-292, 1905.

Beiträge zur Kenntnis der Heine-Medinschen Krankheit, Berlin, S. Karger, 1907.

Ueber akute Poliomyelitis und Polyneuritis, Ztschr. f. d. ges. Neurol. u. Psychiat. 4: 54-66, 1910.

Die akute Poliomyelitis bzw. Heine-Medinsche Krankheit. In Handb. d. Neurol. (Lewandowsky) 2: 807-910, 1911.



NEUROPATHOLOGISTS
OF
CZECHOSLOVAKIA
POLAND
RUSSIA

ARNOLD PICK (1851-1924)

Born in Gross-Meseritsch, Czechoslovakia. Graduated in medicine at Vienna (1875), where he was student assistant to Meynert. Became assistant to Westphal in Berlin (1875), physician to the Irrenanstalt at Prague (1877), and then Professor of Psychiatry to the University of Prague (1886), where he remained.

A prodigious worker in many fields, with 350 contributions to his credit, he is best known for his description of lobar cortical atrophy (since called Pick's disease), the first of a series of publications on which appeared in 1892. His textbook on neuropathology was a landmark (1898). He was the first to put Wernicke's ideas on aphasia on a sound pathoanatomic basis (1909). Studies, such as those on apraxia (1898, 1905) and agrammatism (1902, 1913), brought him recognition as one of the greatest contributors to the knowledge of functional localization in the brain.

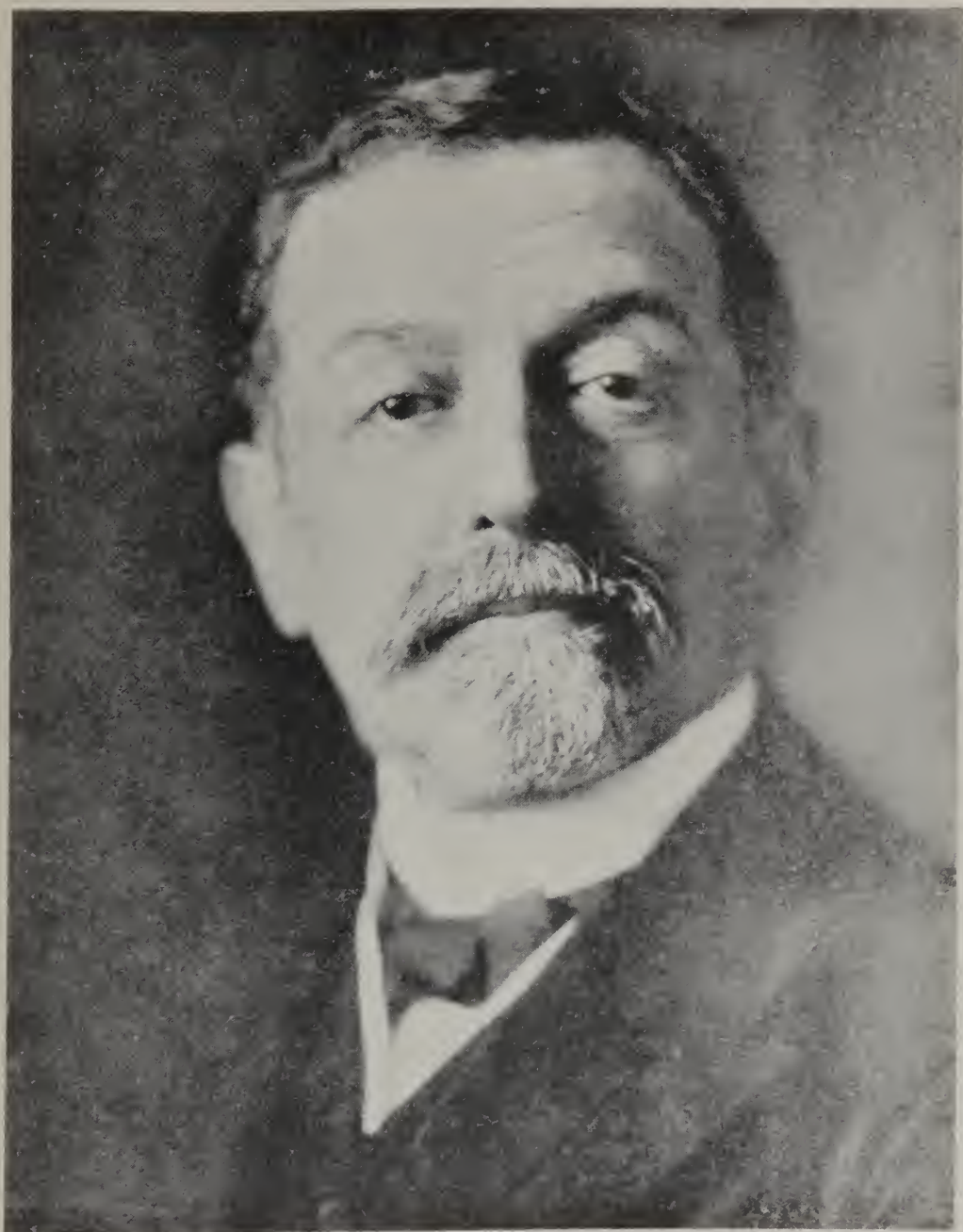
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Beiträge zur Lehre von den Störungen der Sprache, Arch. f. Psychiat. u. Nerven. 23: 896-918, 1892.

Ueber die Beziehungen der senilen Hirnatrophie zur Aphasie, Prag. med. Wehnschr. 17: 165-167, 1892.

Beiträge zur Pathologie und pathologischen Anatomie des Centralnervensystems, Berlin, S. Karger, 1898.

Studien ueber motorische Apraxie, Leipzig, F. Deuticke, 1905.



EDWARD FLATAU (1869-1932)

Born in Plock, Poland. Studied medicine at Moscow, where Korsakow was one of his teachers 1893). Then to Berlin where he studied with Leyden and Oppenheim (until 1899). He returned to Warsaw where much of his work was done at the Neurobiological Institute. Created the first neurological school in Poland.

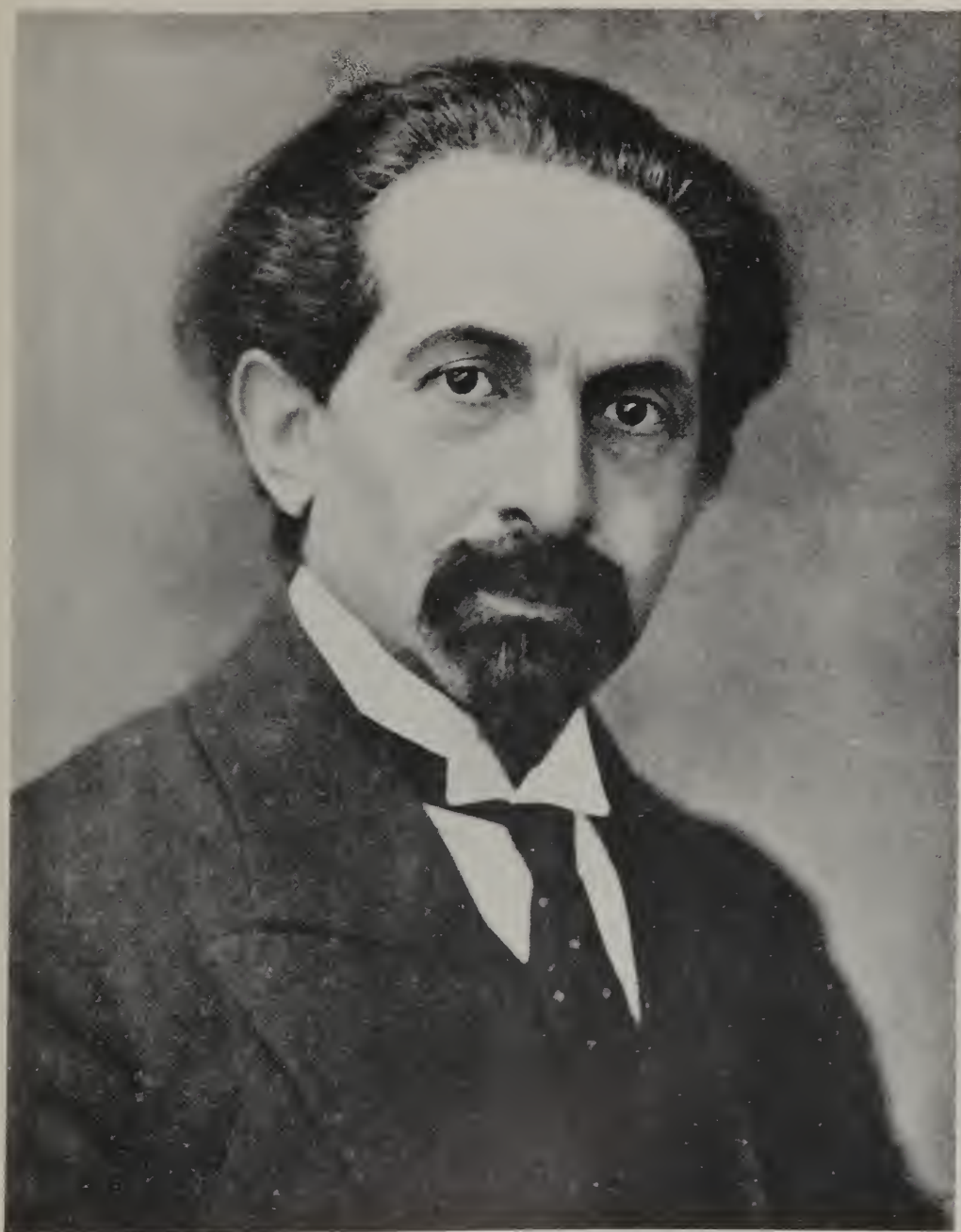
Scholar of the first water, he was one of the pioneers in tracing pathways of the spinal cord on the basis of degeneration following section (1894). The pathology of spinal cord tumors was among his more outstanding contributions (1910). In the experimental field, he succeeded in transferring brain tumors to mice (1921). Reports of other intensive studies includes those on the pathology of meningitides (1921), extrapyramidal disorders (1924), and acute disseminated encephalomyelitis (Flatau-Redlich's disease) (1929).

Selected References

Tumeurs de la moelle épinière et de la colonne vertébrale, *Nouv. Iconog. de la Salpêtrière* 23: 47-87 et seq., 1910.

Recherches experimentales sur les tumeurs malignes du système nerveux central, *Rev. neurol.* 28: 987-999, 1921.

Sur l'épidémie d'inflammation disséminée du système nerveux en Pologne durant l'année 1928, *ibid.* 24: 619-660, 1929.



WLADIMIR MICHAILOVICH VON BECHTEREW (1857-1927)

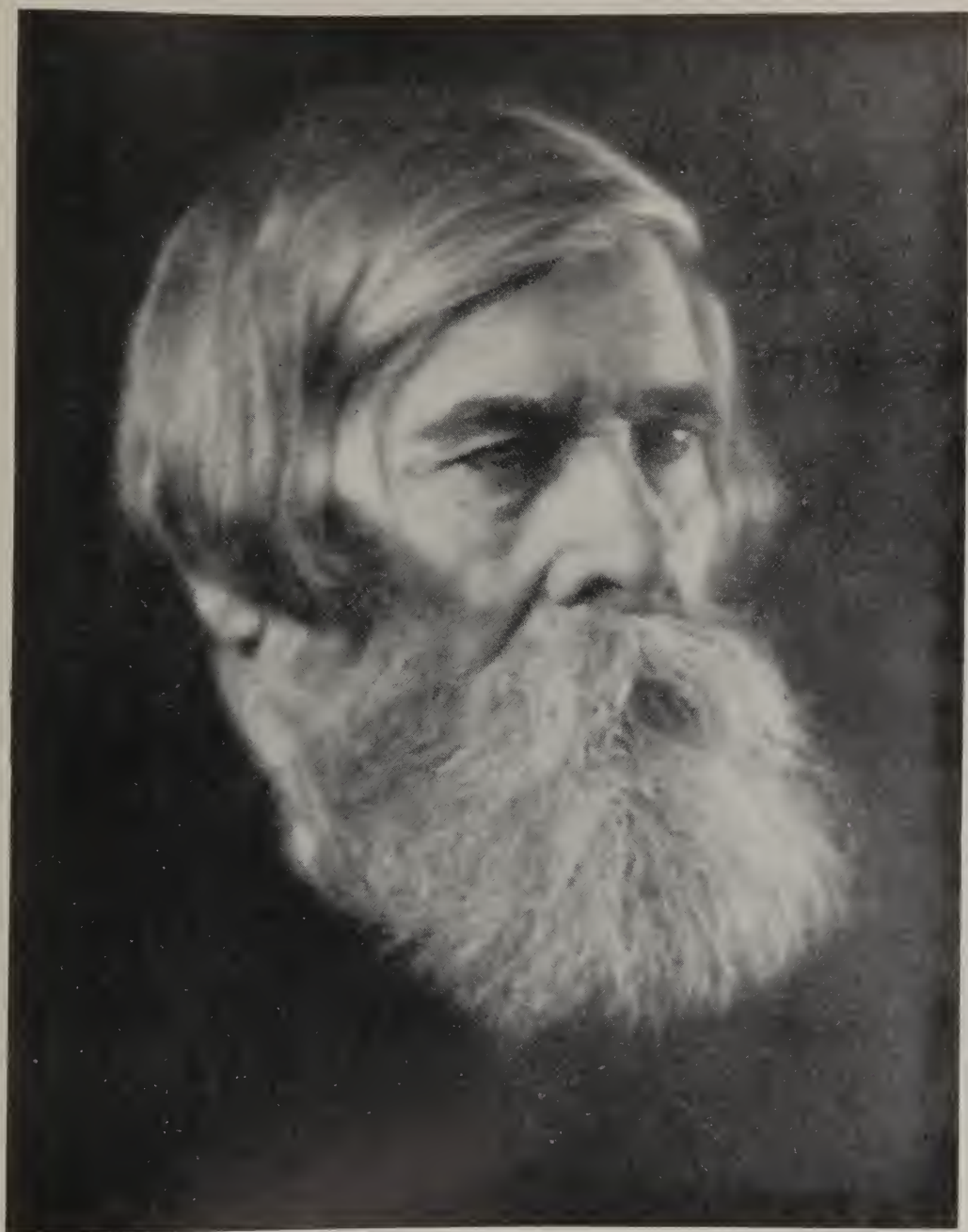
Born in Dorfe Ssarali, Russia. Graduated in medicine at St. Petersburg (1878), and became assistant in the psychiatric clinic under Mershejewsky. Spent a year at Leipzig with Wundt in experimental psychology and with Flechsig in neuroanatomy (1884), and took courses in clinical neurology under Westphal and Charcot. Succeeded Mershejewsky at St. Petersburg (1893) and became Director of the Institut für Gehirnforschung.

For over 40 years he stood at the pinnacle of Russian psychiatry and neurology. His scientific works, mostly on neuroanatomy and neurophysiology, numbered about 500. From the neuropathologic standpoint, he is best known for his contributions on syphilitic cerebrospinal sclerosis (1896) and affections of the cauda equina (1899).

Selected References

Ueber syphilitische disseminirte, cerebrospinale Sklerose, Arch. f. Psychiat. u. Nerven. 28: 742-772, 1896.

Ueber Affectionen der Cauda equina, Deutsche Ztschr. f. Nerven. 15: 222-238, 1899.



NEUROPATHOLOGISTS

OF

HUNGARY

SWITZERLAND

ROUMANIA

KÁROLY (KARL) SCHAFFER (1864-1939)

Born in Vienna. Obtained degree in medicine at Budapest. Qualified in neuropathology (1892), after which he became Professor to the University (1901) and Director of the newly founded Instituto Neurohistológico (1912). Among his pupils were Miskolczy, Baló, Lehoczky, and von Sántha.

In addition to his works on anatomy and development of the nervous system, Schaffer was distinguished for his many contributions in the field of neuropathology. Among the best known are those on rabies (1888, 1912), infantile tabes and general paresis (1901), amaurotic family idiocy (1902, 1905, 1909, 1932), hereditary spastic paraplegia (1922, 1926), and amyotrophic lateral sclerosis (with von Lehoczky) (1929). His monograph on the histopathology of hereditary system diseases (1926) and another on the histopathology of neurons (with Miskolczy) (1938) were his crowning achievements.

Selected References

Anatomisch-klinische Vorträge aus dem Gebiete der Neuropathologie. Ueber Tabes and Paralyse, Jena, G. Fischer, 1901.

Ueber die Anatomie und Klinik der Tay-Sachs'schen amaurotisch-familiären Idiotie und Rücksicht auf verwandte Formen, Ztschr. f. jugen. Schwachsinn 3: 19-73 et seq., 1909.

Ueber das morphologische Wesen und die Histopathologie der Hereditär-Systematischen Nervenkrankheiten, Berlin, J. Springer, 1926.



CONSTANTIN VON MONAKOW (1853-1930)

Born in Bobrezowa, Russia. Received degree in medicine at Zürich (1877), where he came under the tutelage of von Frey, Hitzig and von Gudden. Started a private laboratory of brain research at Zürich (1885) which later was incorporated into the University as the Gehirn-anatomische Institut, with him as the Director (1894). His pupils included Adolph Meyer and A. Vogt.

His contributions to the literature numbered well over one hundred. His textbook on neuropathology established him as a master in the field (1896), as did also his monograph on cerebral localization (1914). Moreover, he was preeminent in the field of cerebral malformations (1890, 1899, 1926). Among his other significant works were those on lead encephalopathy (1880) and aphasia and apraxia (1889, 1906, 1909).

Selected References

Gehirnpathologie, Vienna, A. Hölder, 1896, 1905.

Ueber die Missbildungen des Centralnervensystems, *Ergebn. d. allg. Path. u. path. Anat.* 6: 513-582, 1899.

Die Lokalisation im Grosshirn und der Funktion der kortikale Herde, Wiesbaden, J. F. Bergmann, 1914.



GHEORGHE MARINESCU (GEORGES MARINESCO) (1864-1938)

Born in Bucharest. Studied with Babes at Bucharest, Charcot and Pierre Marie at Paris (1868), Weigert at Frankfurt, and Dubois-Reymond at Berlin. Most of his life and work were closely associated with French neurology. Obtaining his doctorate in Paris (1897), he settled in Bucharest, and became Professor of Neurology to the University.

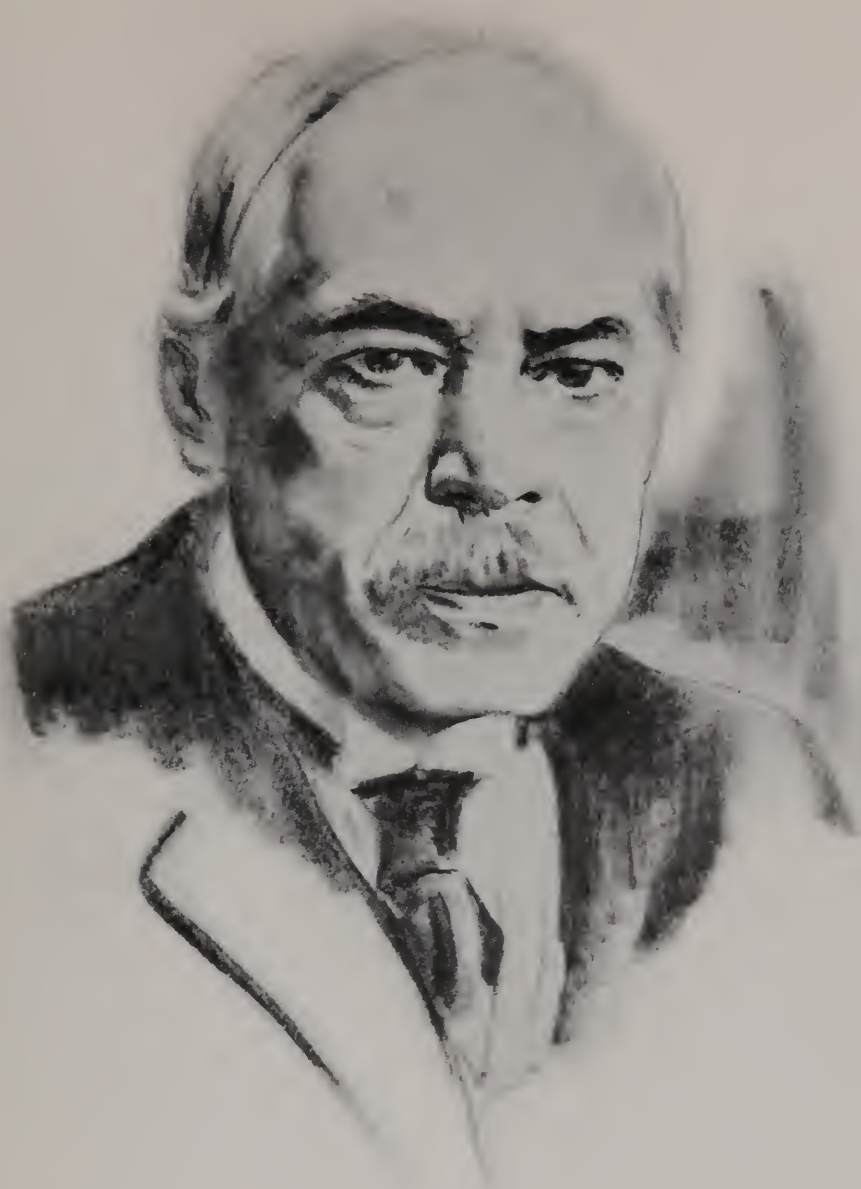
Marinesco's contributions, 249 in all, covered a wide field. His masterly work in Babes and Blocq's *Atlas of Pathologic Histology of the Nervous System* in 1892 brought him early recognition. His description of lesions in the substantia nigra in parkinsonism (1893) was the basis of Brissaud's theory (1894) of the nigral origin of this disorder. He did much to elucidate the sleep-waking mechanism (1929) and is well known for his investigations on botulism (1896), herpes zoster (1923, 1927), and the juvenile form of amaurotic family idiocy (1924, 1926, 1927).

Selected References

Atlas der pathologischen Histologie des Nervensystems, Berlin, A. Hirschwald, 1892. (with Babes and Blocq).

Sur un cas de tremblement parkinsonien hémiplegique symptomatique d'une tumeur du pedoncule cérébral, *Comp. rend. Soc. de biol.* 5: 105-111, 1893. (with P. Blocq).

Beiträge zu einer allgemeinen Theorie des Schlafes, *Ztschr. f. d. ges. Neurol. u. Psychiat.* 122: 23-47, 1929. (with O. Sager and A. Kreindler).



NEUROPATHOLOGISTS
OF
THE UNITED STATES

BERNARD SACHS (1858-1944)

Born in Baltimore. Studied medicine in Strassburg and Berlin, receiving his degree from the University of Berlin (1882). Then undertook work with Meynert at Vienna, Hughlings Jackson at London, and Charcot at Paris (until 1884). His subsequent appointments in New York included positions as Neurologist to the Montefiore Hospital (1887), Chief of the Neurologic Service at Mt. Sinai Hospital (1900) and Professor of Clinical Neurology to the College of Physicians and Surgeons, Columbia University (1933).

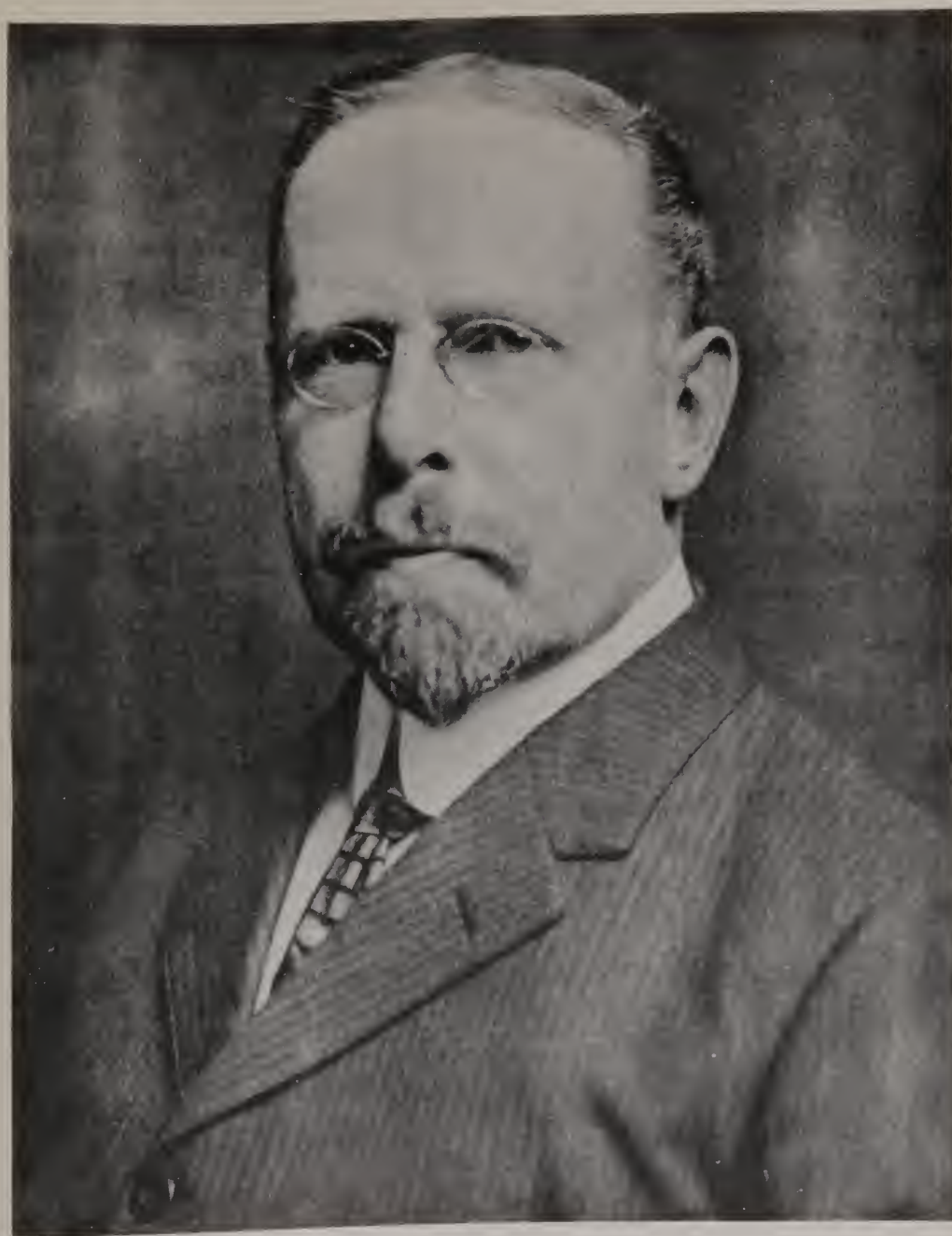
Although essentially a clinician, he did much in the field of neuropathology. His work on amaurotic family idiocy was his masterpiece (Tay-Sach's disease) (1887). His treatise on the nervous diseases of childhood was the first American publication on this subject (1895). He is also known for his neuropathologic work on syphilis (1891, 1910) and infantile cerebral palsies (1891).

Selected References

On arrested cerebral development, with special reference to its cortical pathology, *J. Nerv. & Ment. Dis.* 14: 541-553, 1887.

Contributions to the pathology of infantile cerebral palsies, *New York M. J.* 53: 503-510, 1891.

A family form of idiocy, generally fatal, and associated with early blindness (amaurotic family idiocy), *ibid.* 63: 697-703, 1896.



WILLIAM GIBSON SPILLER (1863-1940)

Born in Baltimore. Graduated in medicine from the University of Pennsylvania (1892), after which he made an extended tour of European centers, working with Obersteiner, Edinger, Marburg, Dejerine and Gowers. Returning to Philadelphia, he became Professor of Neuro-pathology and Associate Professor of Neurology to the University (1903), and succeeded to the chair of neurology on the resignation of Mills (1915).

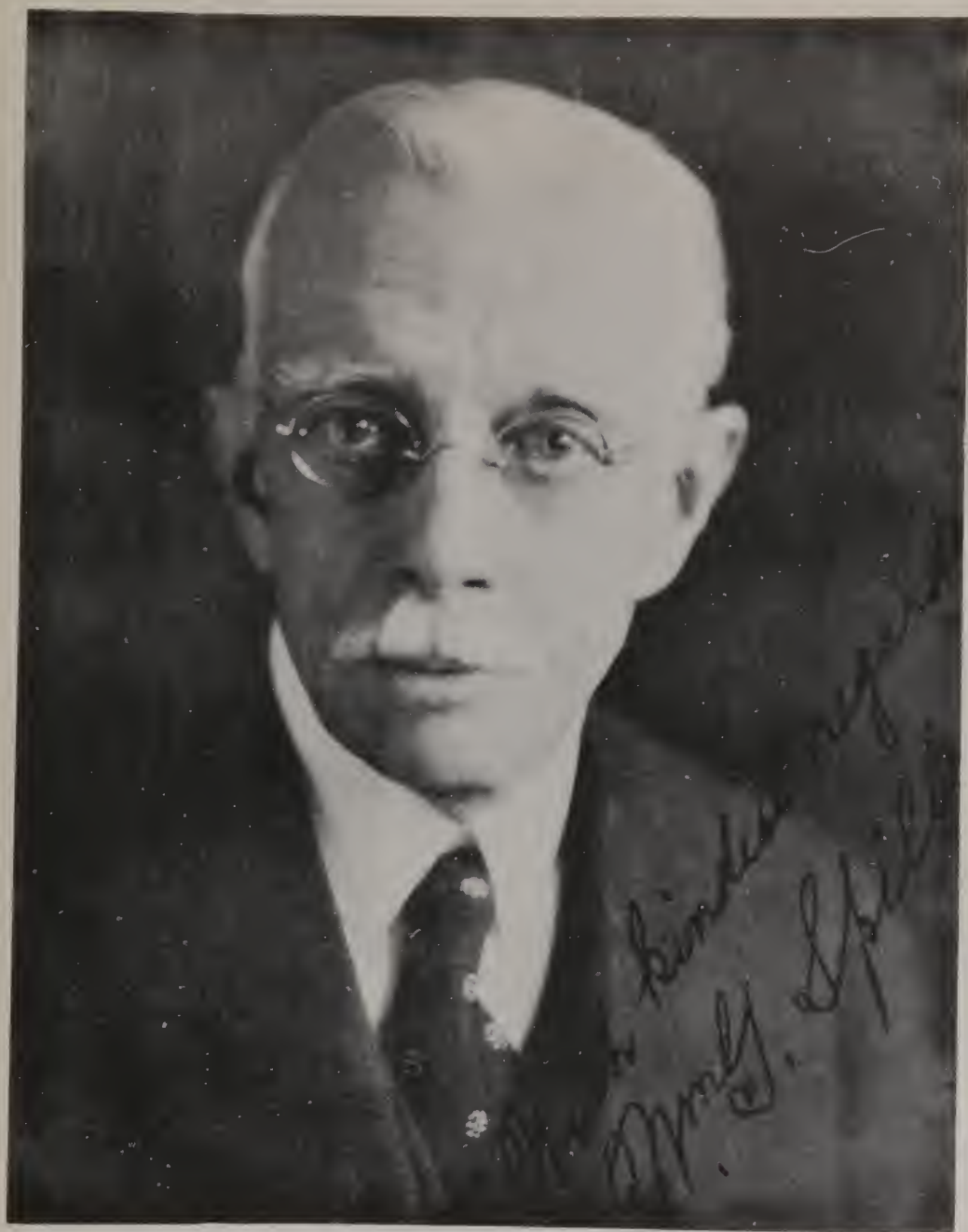
His work with Frazier on division of the trigeminal nerve for the relief of *tic douloureux* (1902) is regarded as one of his most important contributions. Important also was his work on brain and spinal tumors (1905, 1907, 1923), vascular occlusions of the brain stem (1908), pellagra (with Anderson) (1913), smallpox encephalitis (1929), and the pathology of surgical disorders of the nervous system (1907).

Selected References

The division of the sensory root of the trigeminus for the relief of *tic douloureux*, Univ. Pennsylvania Med. Bull., 1902. Pp. 342-352. (with C. H. Frazier).

Pathology of the chief surgical disorders of the nervous system and its importance in clinical diagnosis. In Keen's Surgery 2: 653-685, 1907.

The symptom-complex of a lesion of the uppermost portion of the anterior spinal and adjoining portion of the vertebral arteries, J. Nerv. & Ment. Dis. 35: 775-778, 1908.



SIMON FLEXNER (1863-1946)

Born in Louisville, Kentucky. Obtained degree in medicine from the University of Louisville (1889). Joined staff at Johns Hopkins Hospital as Welch's Fellow (1891), becoming Professor of Pathological Anatomy (1899); during this time he visited clinics at Strassburg and Prague. As member of U. S. Army Board for the Investigation of Tropical Diseases on the Philippine Islands, he made important contributions to the knowledge of plague and dysentery. Became Professor of Pathology at the University of Pennsylvania (1900), and then Director of the Rockefeller Institute for Experimental Research (1902), where he remained for 32 years.

He did much to initiate the heroic age in American medicine. He is best known in the field of experimental neuropathology for his work on epidemic meningitis (1917) and poliomyelitis (1913, 1917).

Selected References

Experiments of the cultivation of the virus of poliomyelitis, J. A. M. A. 60: 362, 1913. (with H. Noguchi).

The relation of the meninges and choroid plexus to poliomyelitic infection, J. Exper. Med. 25: 525-537, 1917. (with H. L. Amoss).

Mode of infection, means of prevention and specific treatment of epidemic meningitis, Rockefeller Inst. for Med. Research, 1917.



HIDEYO NOGUCHI (1876-1928)

Born in Okinamura, Fukushima, Japan. Obtained degree of medicine in Tokio. Became assistant to Kitasatos at the Institute of Infectious Diseases (1898). Went to China and Manchuria with commission for the study of plague (1898). Obtained post in the Department of Pathology of the University of Pennsylvania (1900). Became Research Assistant at Carnegie Institution (1903), after which he joined the staff at Rockefeller Institute for Medical Research (1904).

His output on original lines was enormous. Among his accomplishments was the culturing of the *Treponema pallidum* (1913). The work which qualified him for inclusion in the annals of neuropathology was his demonstration of the *Treponema pallidum* in the human brain (1913).

Reference

A demonstration of *Treponema pallidum* in the brain in cases of general paralysis, *J. Exper. Med.* 17: 232-238, 1913. (with J. W. Moore).



HARVEY WILLIAMS CUSHING (1869-1939)

Born in Cleveland, Ohio. Obtained degree in medicine at Harvard (1895). Became Associate Professor of Surgery at Johns Hopkins University (1902), Professor of Surgery at Harvard (1912), and Sterling Professor of Neurology at Yale (1933). As a neurosurgeon he left a lasting impress.

In the field of neuropathology he was preeminent for his work on brain tumors, the histologic aspects of which were studied mainly by his associates Percival Bailey and Louise Eisenhardt. Among his other outstanding contributions were those on the disorders of the pituitary gland (1912) and the hypothalamus (1932). Also he is well known for bringing into focus an endocrine disorder, since known as Cushing's syndrome.

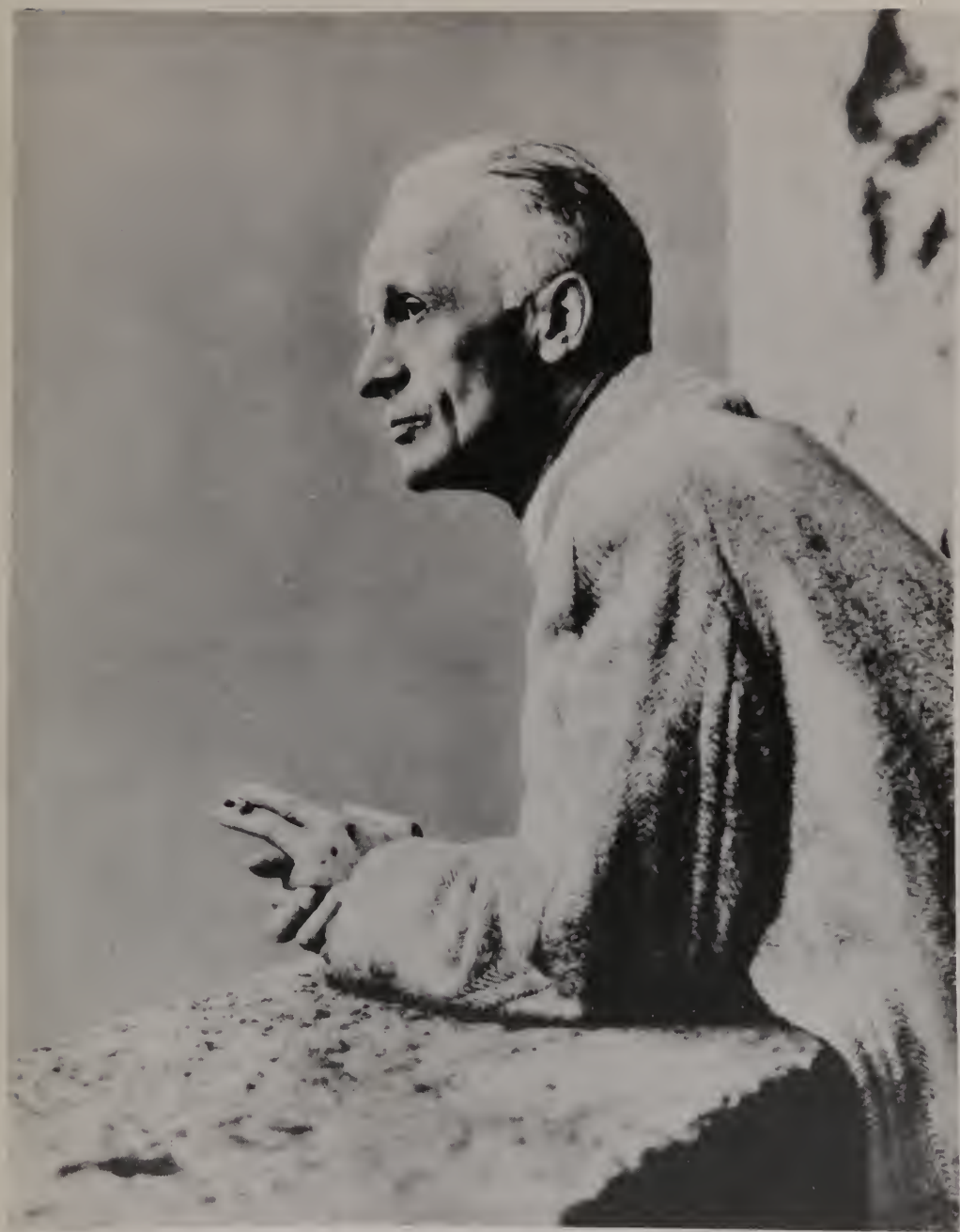
Selected References

A classification of the tumors of the glioma group on a histogenic basis with a correlated study of prognosis, Philadelphia, J. B. Lippincott Co., 1926. (with P. Bailey).

Papers relating to the pituitary body, hypothalamus and parasympathetic nervous system, Springfield, Ill., Charles C Thomas, 1932.

Intracranial tumours, Springfield, Ill., Charles C Thomas, 1932.

Meningiomas, Springfield, Ill., Charles C Thomas, 1938. (with L. Eisenhardt).



JAMES RAMSAY HUNT (1874-1937)

Born in Philadelphia. Obtained medical degree from the University of Pennsylvania (1893). Entered the neurologic field under Mills. Did postgraduate work with Obersteiner in Vienna, Oppenheim and Cassirer in Berlin, and Pierre Marie, Babinski and Dejerine in Paris. Returned to Philadelphia, spending a year with Burr, and then went to Cornell University in New York with Dana (1900-10), after which he held the chair in neurology at the College of Physicians and Surgeons, Columbia University.

He is best known for his work on herpetic inflammation of the geniculate ganglion (1907 et seq.), pallidal syndromes (1917), and juvenile paralysis agitans (1918).

Selected References

On herpetic inflammations of the geniculate ganglion. A new syndrome and its complications, *J. Nerv. & Ment. Dis.* 34: 73-96, 1907.

A case of juvenile paralysis agitans. Primary atrophy of the pallidal system of the corpus striatum, *Neurol. Bull.* 1: 237-242, 1918.



